SPACE, PLACE, AND DISORDER IN URBAN EMERGENCY MEDICAL SERVICES WORK

A dissertation presented

by

Christopher G. Prener

to
The Department of Sociology and Anthropology

In partial fulfillment of the requirements for the degree of

Doctor of Philosophy

in the field of

Sociology

Northeastern University
Boston, Massachusetts
June, 2015
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ABSTRACT OF DISSERTATION

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Abstract

Emergency Medical Services (EMS), which are available to virtually all American communities, form physical connections between individual patients and city- and county-level health resources. They therefore provide distinct connections between individuals and place and are uniquely suited to address questions relating to the role that neighborhoods play in structuring individual health outcomes. By combining field observations, qualitative interviews, and quantitative as well as GIS analyses of sketch map and dispatch data, this project analyzes the way place structures EMS work. During downtime between calls, certain neighborhoods provide opportunities for Emergency Medical Technicians (EMTs) and Paramedics to rest and recharge. Downtime also opens providers both to conflict when their presence conflicts with other users’ constructions of who should use public areas of cities.

This conflict also manifests itself in the role EMS providers play in managing a variety of social and medical problems, particularly homelessness and substance use. These issues underscore the role of the EMS system as part of the social safety net, a role that stands in contrast to the official construction of the EMS system as an acute care network. Providers respond to homelessness by participating in the informal exclusion of individuals who are street homeless from particularly neighborhoods, a different side of conflicts over the use of urban space. Providers’ perceptions are further complicated by spatial stigmas that they hold about certain neighborhoods in addition to perceptions that stigmatize illnesses and certain patients, like homeless individuals. These stigmas intersect and open providers to “getting burned” when their biases lead to the misattribution or downplaying of symptoms. This underacknowledged role as “street level social workers” illustrates the ways in which neighborhoods structure work routines that in-turn can have significant impacts on patients. Such a view of urban EMS work adds to our understanding of how a variety of stigmas affect individuals, how neighborhood stigmas arise, and how inter-neighborhood institutions play a role in structuring opportunity for urban residents.
Dedication

For Johanna and Colden
Acknowledgements

First and foremost, I want to thank Alisa Lincoln for her mentorship and guidance throughout the past seven years. Without a quick conversation after her presentation during my cohort’s first year pro-seminar, this project may not have ever come into being. Alisa was quick to support the initial pilot project that gave me my first field work experience and the professional connections with "Private Ambulance". Since then, she has guided me through conference presentations, manuscript submissions, and grant proposals. Along the way she has allowed me to develop many of the interviewing, programming, and analysis skills that I used for my dissertation on her own research projects, experience that I will forever be grateful for.

Steve Vallas, Shelley Kimelberg, and Patrick Sharkey all deserve an enormous amount thanks for their dedication to both this project as well as my wider graduate career. Steve has been instrumental in helping grow my professional network, in guiding me through the publication process, and helping identify sources of funding that made both this project and my earlier pilot project of EMS work possible. Shelley, who is without a doubt the best teacher I have had the pleasure of learning from, gave me my first introduction to urban sociology as well as my first opportunities to teach in her Introduction to Sociology class. Shelley also introduced me to Pat, whose insights have been crucial for developing the trajectory of this research. I am tremendously greatful for the time all three of them have given to helping me develop this project.

In addition these committee members, a number of other faculty have played key roles in the development of this project. Theresa Osypuck introduced me to the neighborhood effects literature, among many others, in her Social Epidemiology course. James Connolley and Daniel O’Brien were instrumental in the development of the spatial data collection and analyses that became a cornerstone of this project. James also read drafts of the more technical sections of the dissertation, feedback for which I am tremendously grateful. I also owe thanks to Lauretta Grau,
whose feedback during the 2014 Mixed Methods International Research Association conference resulted in the development of the 'alternative cartography' approach to data visualization that is used throughout the dissertation.

I very much doubt I would have ever picked EMS as a research focus without a gentlemen named Steve Watters. Steve introduced me to the world of EMS as a teenager through a youth program at the local EMS agency where I grew up. Steve, along with many of the other Dispatchers and EMTs at Perinton Ambulance, helped me develop a love for pre-hospital medicine that propelled me through a number of EMS jobs and, eventually, graduate school. I will always be greatful to Steve and to Perinton Ambulance for that first opportunity to experience EMS work.

The dissertations' text would never have been completed without the support and keen editorial eyes of Anna Revette and Lisa Pal. Anna and Lisa have been tremedous friends and supports without whom I cannot imagine having completed graduate school. Christopher Hovey, our honorary cohortmate and my dear friend, got me through my first experience with Stata and has been there for every line of code since.

I want to thank my parents for instilling in me a love of learning that carried me through St. Lawrence and Northeastern. You have always been there for Nora, Johanna, Colden, and I, and I would not have been able to write this dissertation without your help and sacrifice this past year. Johanna, this dissertation is for you. Without your love, support, and calming presence I would have never come close to to completing this dissertation. You have been there through the highs and lows of coursework, fieldwork, and endless drafts, and have given so much to this process that this dissertation is as much yours as it is mine. I love you, and I cannot wait for our next adventure.
Disclaimer

The data referred to as the “Calls for Service” dataset is derived from data provided to the author by the “Chapman” Police Department under the terms of a Non-Disclosure Agreement. These analyses are solely the product of the author and do not represent the position or conclusions of the “Chapman” Police Department or the “City of Chapman”.
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CHAPTER 1: Introduction

The wail of sirens emanating from an ambulance as it rushes to a call for assistance is a familiar part of the urban landscape. The accompanying photograph (FIGURE 1.1, see p. 253) could have been produced in almost any American city – aging high-rise housing, cracked pavement, and a nearly empty street dominate the scene. In fact, the high-rise in the image is a tower at the Chicago Housing Authority’s Cabrini Green complex that, before its demolition in 2010, was a “national symbol of urban despair” (Sampson 2012:9). Neighborhoods like Chicago’s Near North Side, where Cabrini Green was located, have likewise become symbols of deeply entrenched urban social problems including housing decay, racial segregation, violence, substance use, poverty, and homelessness. Scenes like FIGURE 1.1 (see p. 253) are therefore all too familiar to urban scholars. For the Emergency Medical Service (EMS) providers in cities like Chicago, work in these neighborhoods is a routine part of their jobs. Studying EMS providers and their work therefore presents a unique opportunity to understand how cities and urban social problems impact both residents and those whose job it is to work in urban areas.

Cabrini Green, Chicago’s Near North Side, and neighborhoods like them also represent a telling example of the impact that place can have on first responders. In many cities, neighborhoods were for a time ‘no go areas’ for EMS personnel. During the 1960s and the 1970s
on Chicago’s South Side, police and ambulance personnel would be shot at from the Robert Taylor Homes (Lemann 1992; Venkatesh 2000). The Chicago Police all but retreated for a time, significantly diminishing their presence at both the Robert Taylor homes and Cabrini Green (Venkatesh 2000). In Boston’s Columbia Point housing during the same period, ambulances would not enter the South Boston project without a police escort (MacDonald 1999). These no doubt are extreme cases; today, there is no evidence of systematic refusals by EMS providers to enter particular areas of cities. Indeed, rather than refusing to provide care in these areas, EMS providers are working daily in these very same types of neighborhoods (Patrick 2005), and regularly face a wide range of social problems as they deliver care (Mannon 1992). Yet our understanding of how place impacts the work of Paramedics, and in turn the outcomes of their patients, is quite limited. There are few social science studies of any type regarding EMS care in the United States and the clinical literature on EMS care is similarly meager, an issue lamented by the Institute of Medicine (IOM; 2007a) in their landmark analysis of pre-hospital care.

At the neighborhood level, Emergency Medical Services (EMS) like the Chicago Fire Department (pictured in FIGURE 1.1, see p. 253) form a nationwide, community based health care network. Importantly, the EMS system is open and accessible to all, providing care regardless of a patient’s insurance status or their ability to pay for that care. EMS providers form a physical connection between individual patients and city- and county-level health resources (IOM 2007a), serving as a crucial bridge between patients’ homes and hospitals for the nearly 32 million patients treated each year (Federal Interagency Committee on Emergency Medical Services [FICEMS] 2011; National Center for Health Statistics [NCHS] 2013). The ubiquity of EMS services, and their degree of ‘embeddedness’ in neighborhoods, makes them an essential element of the public health and public safety institutions available to communities.

Using a mixed methods approach, this study demonstrates the variety of ways in which urban EMS work is an inherently spatial activity that is both influenced and constrained by where it takes place. The effect of place on EMS work extends both to the frequent periods of downtime between calls as well as the emergency work that characterizes the institution. What
follows is an analysis of the variety of ways in which space affects the instrumental work of EMS providers as well as their outlooks about patient care, socially stigmatized disorders, and the neighborhoods that they work in on a daily basis. This study also analyzes the ways in which the EMS system is implicated in the management of space in one particular neighborhood where homelessness and substance use are a constant focus for EMS providers. This role of ‘street level social workers’ (Mannon 1992) that EMS providers play represents a key tension in urban EMS work between the formal mandate of the EMS system to provide acute medical care and the system’s latent function as a central element of the urban social safety net.

**Emergency Medical Services in the United States**

The Emergency Medical Services (EMS) system in the United States is a relatively recent development, coming into its own during the 1960s in response to a growing recognition that automobile deaths and cardiac arrest were both key and preventable causes of morbidity and mortality (IOM 2007a; Pozner et al. 2004; Zink 2006). Considerably younger as an organized system than both law enforcement and fire fighting (Greenberg 1998; Monkkonen 2004), the modern EMS system in the United States was prefigured by nearly a century of ambulance services that could do little more than offer patients transport to a hospital. This medical transport service had its roots in the American Civil War, when Union generals organized wagon services to transport the wounded off the battlefield. After the war, civilian organizations translated these military practices into the first municipal ambulance services in Cincinnati (1865) and New York City (1869; Pozner et al. 2004).

These initial urban systems were replicated across the United States so that, a century later, a patchwork of local ambulance services existed in most urban and suburban areas of the country. At that time more than half of all ambulances in the United States were operated by local funeral homes and were staffed by attendants who lacked even basic first aid training (Pozner et al. 2004:240). For physicians returning from World War Two and then the conflict in Korea, there was a growing recognition that battlefield care had greatly outpaced the quality of
care available to civilians on the home front (IOM 2007a:32-33). The identification of this disparity in care coincided with the first evidence of cardiopulmonary resuscitation’s (CPR) effectiveness and a national recognition that automobile accidents were the leading cause of mortality for young Americans (IOM 2007a:32-33; Pozner et al. 2004).

Federal legislation in 1966, spurred by the coalescence of these factors, transformed this untrained, diffuse network of local ambulance services into a more organized and sophisticated system that remains in place today, though with a substantial growth in the clinical capacity of providers (IOM 2007a). Providers at this study’s field site (see CHAPTER 4, pp. 83-87) were fond of describing their care by noting that they could provide the same level of care that would be available in the first thirty minutes at a hospital’s emergency department. The expanding role of Paramedics has had much to do with this capability.

The EMS care delivered to patients occurs at two broad levels: Basic Life Support (BLS) and Advanced Life Support (ALS). Though base curricula are set nationally, there is substantial between-state variation in how these levels are defined and certified. BLS providers, typically known as Emergency Medical Technicians (EMTs), make up approximately sixty percent of the EMS workforce (IOM 2007a:130). BLS care is non-invasive first aid, with EMTs trained to treat basic fractures, lacerations, and the like in addition to identifying the symptoms of more serious injuries and illnesses (IOM 2007a:128-129). Paramedics provide more advanced ALS care and constitute another third of the EMS workforce (IOM 2007a:130). Paramedics have a wide range of more invasive interventions at their disposal, including intravenous medications and tools to manage critically ill and injured patients. Many of these are the same interventions that would be initially available to a patient if they were being treated solely in an Emergency Department (IOM 2007a:128-129).

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1 The remaining seven or so percent of EMS providers are trained as EMT-Intermediates, capable of some more advanced procedures. Though this level exists in the state where this research takes place, EMT-I’s do not practice at the research site and, more generally, are not common in urban pre-hospital medical care.
In addition to differing based on clinical capacity, these two levels of providers also differ greatly in terms of the educational requirements necessary to obtain certification. EMTs typically receive around two hundred hours of classroom training, while Paramedics may receive anywhere from several hundred to several thousand hours depending on the state (IOM 2007a: 128-130). This sets EMTs and Paramedics apart from other health care providers, whose educational credentials typically involve a minimum of a Bachelor’s degree. EMS providers therefore have a reputation within health care as “taxi drivers” or “ambulance drivers,” terms where carry a connotation of amateurism and belie the sophisticated clinical capacities of many Paramedics (Whalley and Barley 1997).

**Key Issues in American Pre-hospital Medicine**

It is misleading to speak about the Emergency Medical Services system because, in reality, EMS in the United States is really a patchwork of local agencies operating under the governance of regional, state, and federal guidelines. Federal oversight, which initially spurred the development of EMS in the United States, was substantially weakened between 1978 and 1981 by jurisdictional conflicts and federal budgetary legislation. As part of the legacy of automobile deaths in creating the modern EMS system, the Department of Transportation retained authority over EMS policy at the national level. This authority, however, did not extend outside of setting national guidelines for training. Wide variation therefore developed both between and within states in terms of the management, organization, and scope of care of the EMS system. The consequence of this fragmentation, according to the Institute of Medicine, was that

Over the past 25 years, EMS systems have developed haphazardly nationwide, regulated by state EMS offices that have been highly inconsistent in their level of sophistication and control. The result has been a fragmented and sometimes balkanized network of underfunded EMS systems that often lack strong quality controls (IOM 2007a:18). This quote underscores the complex regulatory environment that EMS agencies had to contend with beginning in the 1980s. The IOM’s report argued that this balkanized approach to organizing EMS led to systematic deficiencies within the EMS system. The IOM’s report broke these deficiencies down into six categories: safety, effectiveness, patient-centeredness,
timeliness, efficiency, and equity (IOM 2007a:18-24). The report criticized weak clinical standards that had been adopted despite little evidence to support their efficacy, operational and workforce practices that had received no assessment from researchers, a failure to systematically collect patient data and track outcomes, unpredictable and sometimes violent interactions with patients, poor coordination between EMS services, and vast differences in the quality of care available to patients in different jurisdictions. Together, these represented an “evolving and emerging crises” (IOM 2007a:18) for policy makers and the EMS system.

While many of the issues identified by the IOM’s report are beyond the scope of this study, several of their findings do have particular salience. Of particular note is the IOM’s comment regarding patient-centered care. The report stated that

EMS systems are geared toward meeting the needs of patients with specific acute conditions, such as heart attack, stroke, and injuries resulting from automobile crashes and other types of accidents. However, they are not always well equipped to meet the needs of special populations or patients with less acute medical conditions (IOM 2007a:21).

They further noted that “the overwhelming majority of EMS patients have relatively minor complaints” (IOM 2007a:22), though no source was provided for this finding and no further attention was paid to this paradox in the IOM’s report. Instead, much of the space dedicated to clinical issues focused on continuing to increase the capacity of the EMS system to respond to emergent medical needs, particularly trauma and disaster scenarios.

This illustrates a fundamental tension for EMS systems both in the United States and elsewhere - despite minor complaints constituting the bulk of EMS work, “inappropriate use” (Richards and Ferrall 1999) and “frequent users” (Malone 1995) have often been perceived to be a major issue for EMS systems and have been discussed in a way that diminishes the responsibility of the EMS system to these patients (Billittier et al. 1996; Brown and Sindelar 1993; Gardner 1990; Palazzo et al. 1998). Poverty has frequently been noted as a major contributed to so-called “ambulance misuse” (Kawakami et al. 2007). Low socioeconomic status (Rucker et al. 1997; Svenson 2000), Medicaid enrollment (Billittier et al. 1996), and lack of access to an automobile (Camasso-Richardson et al. 1997) have all been found to contribute to
greater use of the EMS system for non-acute or sub-acute medical conditions. Yet, despite these findings, the EMS system not typically discussed as a part of the wider social safety net.

The report also discussed geographic variation in EMS care, particularly between rural and urban EMS systems. Though most the report’s attention in this area was focused on specific issues for rural EMS, EMS providers in urban areas also face a particular set of challenges. They often work in neighborhoods where poverty rates are higher than average and are exposed to a full spectrum of social problems, from substance use to violence to homelessness, on a regular basis (Patrick 2005). Though these issues are present in small doses in many rural areas, the sheer quantity of patient contacts in urban areas makes them of greater concern for urban EMS providers, who may face these issues multiple times in a shift. Additionally, the medical centers that they transport patients to may be more likely to deal with overcrowding (IOM 2007a:39-40; see also IOM 2007b for an expanded discussion). Their place in these communities as the primary street-level health care providers means that EMS providers have the task of:

...bringing into the health-care system those who otherwise would not get there, giving care and attention to the neglected and forgotten...the counterpart of the social worker in the field of health-care seems to be the urban EMT and paramedic. When the EMT and paramedic bring medical attention to the so-called crock, administer to abused and neglected children, and make house calls on the elderly and urban poor, they are patching up the failures of modern health-care systems and, I suppose, in an even larger sense they daily witness the failures of modern society (Mannon 1992:144).

EMS providers’ responses to these problems may well impact treatment trajectories and ultimately patient outcomes since the EMS system represents the initial contact with the health care system for many patients (IOM 2007a). This description of the ‘street level social worker’, to paraphrase Mannon (1992), fits with the passing mention of widespread misuse of the EMS system in the IOM’s 2007 report. It also underscores the role of EMS providers play as an under-acknowledged part of the urban social safety net.

Limited research, patients “misusing” the EMS system, and the impact of social problems like poverty, isolation, and substance use have all been identified as major issues for the EMS system. However, little is known about how EMS providers think and feel about their work and the patients that they interact with (e.g. Tobin et al. 2005), particularly patients who do not fit
the ideal type of a “critical” patient. Sociological accounts of EMS work in this vein (Mannon 1992; Metz 1981) are few and far between. Capturing these beliefs is critical, particularly when they concern stigmatized conditions such as homelessness, substance use, and mental illness, where individual bias among providers and larger “institutional stigmas” (Corrigan and Kleinlein 2007; Lincoln 2006; Pescosolido et al. 2008) can influence access to care, the scope and quality of clinical interventions, and an individual’s experiences while seeking treatment. These beliefs may also extend to place, with EMS providers playing a critical role as a mediating force between neighborhood and patient outcomes.

**Guiding Theories**

The role that neighborhood conditions and context play in the framing of EMS provider understandings of their work and their patients intersects a number of sociological subfields, including the sociology of the health and illness, urban sociology, and the sociology of work. The sociological study of health and illness, and two of its core concepts, a mediational model for understanding the ways in which ecological factors influence health (Acevedo-Garcia and Lochner 2003) and fundamental cause theory (Link and Phelan 1995), are the essential elements of this project’s theoretical framework. These ideas provide an explanation for how a variety of social conditions, which are not typically considered proximate causes of illness, “get under the skin” (Hertzman and Boyce 2010) of residents and impact their health.

The influence of place on health is a part of the growing interest in neighborhoods in both the health literature and urban sociology. Neighbors have been theorized to have a variety of impacts on individual health outcomes (Kawachi and Berkman 2003). Indeed, features of neighborhoods such as racial residential segregation have been labeled fundamental causes of health disparities (Williams and Collins 2001). Racial residential segregation also provides an example of the mediational model that predominates the neighborhood effects literature. Residential segregation’s relationship with individual health outcomes is often understood as being mediated by neighborhood poverty (Acevedo-Garcia and Lochner 2003). By extension, I
argue that EMS resources at the neighborhood level, as well as the character of these resources, may operate as a mediating factor between neighborhood conditions and health outcomes.

An element of the neighborhood effects paradigm that is receiving growing attention is the range of cognitive responses to both neighborhood conditions and neighborhoods themselves (Sampson 2013). Understanding these subjective frames as they apply to neighborhoods (Besbris et al. 2015; Jones and Jackson 2011; Sampson and Raudenbush 2004) and assessing their impact on the behavior of residents (Besbris et al. 2015; Sharkey 2006) has been a recent focus of urban sociologists, though interest this topic be traced back to the earliest Chicago School investigations of urban life. Similarly, understanding the ways in which health care providers’ views of patients may impact care has been a recent focus of medical sociology (e.g. Lincoln 2006; Timmermans 1999).

In the sociology of mental health (e.g. Link and Phelan 2001), the concept of stigma (Goffman [1963] 1986) is frequently used to describe the “spoiled identity” or “mark” that illnesses, patients, and perhaps even neighborhoods impart on individuals. The ways in which these various marked statuses combine, described alternatively as multiple (Crandall 1991; Rush 1998) or intersectional stigmas (Collins, von Unger, and Armbrister 2008; Logie et al. 2011), present barriers to patients as they navigate the health care system (Logie et al. 2011). There has been a similar, though smaller, effort to theoretically (Galster 2012) and empirically (Besbris et al. 2015) describe individuals’ perceptions of neighborhood as stigmatized. The subjective frames utilized by EMS providers to understand both the neighborhoods they work in and the patients that they treat, and the ways that these are informed by various stigmas, may therefore provide a pathway through which EMS work mediates the effect of neighborhood on individuals.

Finally, Van Maanen and Barley’s (1984) theory of occupational communities, a perspective from the sociology of work, is used to address the ways in which these social psychological frames become shared. These frames, both for neighborhoods and types of patients, are likely the product both of past life experiences among EMS providers as well as their experiences during the course of their shifts (Patrick 2005). They are also likely the product of spending time
with other EMS providers and first responders while on the job, creating an atmosphere among EMS providers of shared views towards both neighborhoods and groups of patients. This is an example of an occupational community, where shared norms and values come to be a defining feature of a particular group of workers (Van Maanen and Barley 1984). This theory allows for a mechanism through which EMS providers come to views that are widely held within pre-hospital medical care circles. Taken together, these theories from three areas of sociology relevant to this study form a framework for investigating how place influences EMS providers, and how views about patients and place may coalesce within the EMS community and impact patient care.

**Research Questions**

Drawing upon these multiple theoretical perspectives, this project focuses on a question that is key for understanding how place may act to influence health outcomes: how do social factors, specifically neighborhood context and conditions, impact Emergency Medical Service work and pre-hospital medical care? This central question, informed by pilot work with EMS providers, has several theoretically derived research questions:

1. Explain the ways in which neighborhood conditions and context influences the daily work routines of providers: How is EMS work, including emergency responses and downtime activity between calls, shaped by the neighborhoods in which EMS providers work; how do subjective assessments of neighborhood conditions shape providers’ attitudes about patients, patient care, and EMS work more generally?

2. Describe the ways in which dispatch information and providers’ subjective frames inform impressions of particular calls before EMS providers arrive on-scene: How do pre-existing subjective frames for understanding particular neighborhoods and particular socially stigmatized illnesses and disorders influence provider impressions and assumptions about calls before patient contact is even made?

3. Identify the types of work, focusing on non-medical “street level social work” that EMS providers engage in and describe the neighborhood conditions and context within which this work occurs: How do EMS providers function as “street level social workers”, and how do they conceptualize their role in treating patients with non- or sub-acute medical needs and socially stigmatized illness and disorders? Finally, are these commonly shared views among EMS providers in the form of an occupational community?

4. Evaluate the spatial patterning of EMS calls and the effect that social and neighborhood conditions have on this process: How are particular types of calls, specifically socially stigmatized illnesses and disorders, related to place and social conditions, and how are
these trends related to preexisting provider views of particular neighborhoods and the patterning of particular types of calls?

Innovation

These are questions that have received limited attention from sociology, particularly in the area of Emergency Medical Services. EMS research has generally been quite limited (IOM 2007a), and few sociological contributions have been made since the mid-1990s. Pre-hospital medicine has changed a great deal since then, including a large growth in the clinical capacity of providers and an increase in the public safety role of EMS providers. By focusing on EMS providers, this project not only addresses this shortcoming in the literature but also explores a novel institution that may mediate the relationship between neighborhood conditions and health outcomes, thereby extending the literature on the social determinants of health and neighborhood effects. Additionally, this project brings together sometimes divergent sociological subfields, building bridges between health and illness, work and occupations, and urban sociology in ways that deepen this analysis and strengthen the common bonds between these topics.

This project also introduces methodological innovations (see CHAPTER 3) that remain underutilized in sociological and social science research. These include the use of mixed-method analyses that, while growing in popularity (Small 2011), only represent a modest proportion of the sociological literature. Part of this mixed methods design includes the utilization of techniques borrowed from psychogeography and qualitative geography: GIS and “sketch map” techniques are employed to understand both the spatial patterning of call types as well as EMS providers’ perceptions of these patterns. The project also utilizes GIS techniques to produce geocoded field notes, a technique that has been used with only limited frequency (see Gravlee et al. 2006 and Matthews, Detwiler, and Burton 2005 for two of the few examples) but can help to situate qualitative data within a broader, spatially informed context.

This project takes an alternative theoretical and methodological look at the “neighborhood effect” at an intellectual moment when there is a growing call for such innovation in the study of
neighbohoods. In his 2012 keynote address to the American Society of Criminology, Sampson states that:

I believe...that much of social life is interdependent in underappreciated spatial forms, with enduring force, and in cross-cutting ways. Studying this kind of interlocking social world over time demands a theoretical stance and multifaceted analytic approach different than the stylistic version of much contemporary research, in which neighborhood effect is taken to mean the statistical or experimental 'downward' effect of a specific neighborhood characteristic on some individual behavior (or even neighborhood unit) usually at one point in time (Sampson 2013:24).

Sampson’s address, building off Great American City (2012), urges social scientists to broaden the scope of neighborhood effects beyond the individual to “the level of institutions, networks, shared cognition, and populations” (2013:24). This project responds to Sampson’s call for a reimagined neighborhoods effects research agenda. This includes a focus on both the “upward” ways in which neighborhoods impact higher order structures as well as the more traditional focus on the “downward” effects of place on individuals (Sampson 2012; 2013). It also includes a focus on the dynamic ways in which the shared cognitive frames of EMS providers shape the institution of pre-hospital medicine, and how these in turn shape and are shaped by neighborhoods and populations.

* * *

This study’s examination of the multiple ways in which place influences emergency medical services work is laid out in the following chapters. The next three chapters provide background for the study, its methods, and the city and EMS agency that served as research sites for this project. CHAPTER 2 presents an expanded explanation of the theoretical traditions that inform this work and the social science literature on Emergency Medical Services. CHAPTER 3 describes the methodological traditions that underlie this study, the sources of data presented here, and the techniques used for data collection and analysis. CHAPTER 4 describes the social and spatial characteristics of Chapman City as well as the organization and operations of Private Ambulance, which are the respective city and EMS sites of this study.
After these background chapters, there are four substantive chapters that present analytical findings and analysis, beginning with CHAPTER 5. This chapter analyzes the spatial distribution and clustering of EMS work that Private Ambulance engages in within Chapman, documenting the ways in which both emergency calls and the downtime providers have between calls occur at higher rates in particular neighborhoods. CHAPTER 5 also documents the ways in which providers’ perceptions of their work diverge from objective measures of where ambulance calls occur.

CHAPTER 6 addresses downtime - the lulls that punctuate each shift as providers await dispatch to their next emergency response. This is presented as a key element of the first research question because downtime, in its various forms, can constitute a majority of each provider’s shift. Using an expanded sociology of work time, downtime is framed as an important aspect of the temporal and spatial nature of EMS work, allowing providers to catch their breath and perhaps a few minutes of sleep. Downtime is also essential to building occupational community, though the spatial nature of EMS work presents challenges to the development of on-the-job relationships. Finally, CHAPTER 6 describes the spatial nature of downtime and the ways in which occupying public space can be fraught with challenges for EMS providers.

CHAPTER 7 addresses the manifest function of EMS work - responding to emergency calls. As with the prior chapter, perceptions of space and place are woven into providers’ views of their emergency work and are a critical component for addressing the first research question. An analysis of “calls for service” data aimed at addressing the fourth research question suggests that this work is not randomly distributed throughout the city. Providers internalize these trends, though their perceptions are skewed by a focus on work that fits Mannon's (1992) idea of ‘street level social work’. This finding addresses the second and third research questions and has particular salience for one neighborhood.

CHAPTER 8 is dedicated to this neighborhood, which providers universally describe as a central focus of their work. These shared perceptions of this neighborhood rely on multiple, intersecting stigmas about patients and their co-morbid mental and behavioral health issues.
CHAPTER 1: Introduction

These patients become the defining feature of the neighborhood in the eyes of providers and in turn contribute to the development of a widely held neighborhood stigma. Work with these patients is characterized by the “street level social work” described in the third research question. This work draws attention to the ways in which EMS providers not only are affected by neighborhoods but also shape them, and to a deep dissonance between the formal scope of EMS work and the daily reality of urban EMS.

Finally, CHAPTERS 9 and 10 draw together the various stands of data presented in the proceeding chapters. CHAPTER 9 returns to the overarching theories presented in CHAPTER 2 and discusses the ways in which the experiences of the EMS providers described here inform a number of sociological discussions. These include the multitude of ways in which place matters for social life, the impact of neighborhood on health and the treatment of mental health, and the development of community in the workplace. These findings have relevance not only for sociology but also for the policy community interested in emergency medical services, public health, and urban health more generally. CHAPTER 10 then summarizes the study’s findings and connects them with the authors’ broader methodological and substantive research agenda, laying out an outline for future research directions.
CHAPTER 2: Literature Review

As I noted in CHAPTER 1 (see pp. 16-18), the guiding theories at the core of this project are drawn from a number of fields within sociology, including the sociology of health and illness, urban sociology, and the sociology of work. These theories are woven together in a theoretical framework that is at its core composed of two distinct but important ideas: a conception of mediational relationships and fundamental cause theory. These core elements of the framework will be described in some detail before attention is turned, for the bulk of this chapter, to the remaining theories that inspire the research questions posed for this project. These include the literatures on neighborhood effects and the associated methodological challenges to studying them, social psychological responses to place and disorder, occupational communities, and health care work. The chapter concludes with a discussion of the limited social science literature on Emergency Medical Services and a discussion of how this literature could be expanded in a contextually informed way.

Core Theoretical Framework

*Theorizing Mediational Relationships*
CHAPTER 2: Literature Review

This project’s theoretical framework takes the form of what is often described as a mediational model (Acevedo-Garcia and Lochner 2003; Baron and Kenny 1986). Though mediational models typically invoke a hypothesis driven methodology, Baron and Kenny (1986) emphasize the importance of mediational modeling for theorists as well as for methodologists. Responding to the causal use of the terms mediator and moderator in the social sciences, they lay out a specific understanding of mediating concepts as factors that account for the relationship between an independent variable and a specific outcome (Baron and Kenny 1986:1176). The framework that I use here (see FIGURE 2.1, p. 254) is therefore premised on the idea that the link between neighborhood and patient and provider outcomes is mediated by a particular set of contextual and occupational features. This logic is prevalent in the neighborhood effects literature (Acevedo-Garcia and Lochner 2003; Chaix 2009) and provides a theoretical explanation for how neighborhood gets “under the skin” (Hertzman and Boyce 2010). Extending mediational logic allows for a diverse set of theories, drawn from a number of sociological fields, to be modeled together to provide a set of explanations for how neighborhood impacts EMS work and, ultimately, patient outcomes.

Fundamental Cause Theory

The theoretical connection between social conditions and health outcomes is an important element of my framework because it underscores the importance of understanding EMS work not only for its impact on workers, but on patients and by extension their communities. The idea that social factors could impact individual health outcomes is at the core Link and Phelan’s (1995) fundamental causes of disease theory. While not denying the importance of proximate, biologically based risk factors, Link and Phelan (1995) argue that social conditions ‘contextualize’ the proximate causes of illness by explaining the broader conditions within which exposures to disease occur (Link and Phelan 1995:84-85). Further, they argue that certain social factors may be considered “fundamental” because they impact access to health benefitting or detracting resources. These elements persist over time, affecting multiple risk factors for many
health outcomes (Link and Phelan 1995:87). Neighborhood effects, in particular racial residential segregation, have been theorized to be one such fundamental cause of illness (Williams and Collins 2001).

Fundamental cause theory is important to the overall theoretical framework because it opens up an avenue through which Emergency Medical Services can impact health outcomes. Not only does fundamental cause theory provide an explanation for how place can ‘get under one’s skin’ (Hertzman and Boyce 2010), but it challenges researchers to explain the multiple pathways through which inequalities are replicated over time. In this vein, an understanding of the effect that EMS resources have on place may provide yet another piece of the neighborhood effects puzzle. Access to EMS resources could be conceived of as an unexplored way in which neighborhoods impact health, but also as a means through which spatially rooted health disparities are replicated over time. To better examine these links, the remainder of this chapter is focused on developing a theoretical trajectory to connect place and outcomes through a series of mediating factors that may impact the instrumental work of EMS providers. The proposed framework emanates from the neighborhood, making the neighborhood effects literature an ideal place to begin.

The Neighborhood Effects Paradigm

The image of EMS work in Chicago presented at the outset of CHAPTER 1 (see pp. 9-11; see also FIGURE 1.1, p. 253) alludes not only to the intersection of medicine and place, but the long tradition of Chicago as an ideal type (Weber 1978) in urban sociology and as an early focal point in sociological approaches to health (Bloom 2002; Bulmer 1984).1 Chicago remains a focal point

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1 Small (2007; Small and Feldman 2012) has critiqued much of the literature on ghettos as well as the wider urban literature for assuming that Chicago – particularly the South Side – represents all poor, African American neighborhoods. He focuses on the ways in which his experience in Harlem differs dramatically from representations of Chicago in Wacquant’s and other Chicago-based scholars’ work. There is also a wider critique to be made here – the urban literature has largely focused on a small number of cities, including Chicago, New York, Philadelphia, Detroit, Baltimore, and Los Angeles. With some notable exceptions, including Small’s own field work in Boston’s South End (2004), relatively few cities constitute the vast majority of research sites in the empirical literature on urban America.
for sociology in part because of the legacy of the Chicago School, which permeates much of the contemporary literature on neighborhoods. Sampson references both this legacy, and the durability over time of the empirical data on neighborhood effects, in Great American City’s (2012) subtitle: “Chicago and the Enduring Neighborhood Effect”. Though the Chicago School has generated considerable critiques (Dear 2002; Molotch 2002; Robinson 1950), the debates over theoretical and conceptual issues related to neighborhoods have helped to transform the literature on place. These include discussions about operationalizing neighborhood, the meaning of statistical neighborhood effects, and the casual mechanisms that connect place with individual outcomes.

“The Enduring Neighborhood Effect”

Interest in neighborhoods and their role in social life is often traced back to Chicago during the inter-war period. The 20th century rise of urban sociology from the University of Chicago and other pioneering departments was built, like American sociology more broadly, on over a century of inquiry in Europe (Bloom 2002). The 19th century interest in the variation of crime, health, and demographic factors across cities in France and England is epitomized by Snow’s (1855) mapping of London cholera outbreaks as well as early studies of crime (Guerry [1833] 2002) and urban social problems (Mayhew 1861; 1862). Though the role mapping in some of these early analyses has perhaps been overstated (McLeod 2000), this early emphasis on spatial context makes Snow and others early pioneers of “ecological” paradigm emphasized by Park and Burgess ([1925] 1967). Inspired by Durkheim and Simmel (Bloom 2002:68), Park became interested in social disorganization and isolation within cities as well as the ways in

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2 McLeod (2002) argues that much of the story surrounding Snow’s maps and the role that they played in identifying the infamous water pump, as well as their combined impact on the ongoing cholera epidemic, has been distorted by disciplinary mythmaking. She contends that the maps of cholera cases themselves did not lead Snow to identify the water pump in question (though detailed address-level data did), and that the removal of the pump handle came too late to impact the cholera outbreak. Nevertheless, McLeod believes that “Snow deserves a prominent place in the histories of geography, public health, epidemiology and medicine” (2002:933) given his early influence on these disciplines and his groundbreaking, if mischaracterized, research.
which urban areas were structured. Burgess and Park’s concentric zone theory encapsulated their growing interest in the spatial differentiation of areas within cities, which they believed could be divided into “natural areas” that could be characterized by common physical and social traits. Their students and colleagues connected this spatial differentiation and other ecological factors to suicide (Cavan 1928), mental health (Dunham 1959; Faris and Dunham 1939), and crime (Shaw and McKay [1942] 1969).

This body of work inspired generations of neighborhood scholars as well as substantive critiques. These criticisms include rejections of such research as susceptible to the ecological fallacy (Robinson 1950), neo-Marxist critiques of the neighborhood focus in lieu of a wider focus on political and economic power structures in cities (e.g. Gottdiener and Hutchison 2006; Logan and Molotch 1988), and more recent debates about the legacy of the Chicago School (e.g. Abbott 2002; Dear 2002; Molotch 2002; Sampson 2002). However, Sampson (2012) argues that there are a half dozen reasons for the continuing relevance of the School’s theories. These include “its general emphasis on the characteristics of places rather than people...[and the] notion of what we would now call ‘multiple mediating social mechanisms’” (Sampson 2012:39). Both of these ideas, as well as a dialogue with past criticisms of spatial research, are at the core of the contemporary neighborhood effects literature.

This contemporary literature, however, owes as much to the Chicago School as it does to William Julius Wilson and his now classic monographic, The Truly Disadvantaged (1987). Wilson’s analyses represented a return to Chicago both theoretically and empirically, though in ways that greatly diverged from the work of Park, Burgess, and their colleagues. In his analysis of the contemporary African Americans urban experience, Wilson described a “concentration affect” (1987:58) whereby inner city African Americans were socially isolated in particular neighborhoods that had high rates of poverty, violence, and unemployment. According to Wilson, these neighborhoods were structurally disadvantaged because of, among other reasons, a ‘spatial mismatch’ (1987:135-136) that left residents far removed from areas where jobs were
plentiful. His arguments about the clustering of poverty and, later, the decline of industrial American cities (Wilson 1997) stressed the importance of structural forces in shaping inner city opportunity and developing concentrated disadvantage.

Early extensions of Wilson’s empirical analyses focused on quantifying the concentration of poverty in American cities (Jargowsky 1994; 1996; 1998) as well as the segregation of American Americans in particular neighborhoods (Massey and Denton 1988; 1989; 1993; Massey and Eggers 1990; Wacquant and Wilson 1989). These studies were part of a larger focus on specific neighborhoods in cities that have the highest concentrations of poverty and racial residential segregation, often termed the “ghetto” (Chaddha and Wilson 2008; Haynes 2008; Small 2008; Wacquant 2008; Wacquant and Wilson 1989). Together with a growing, largely ethnographic literature focused on the material conditions of urban poverty (Anderson 2000; Duneier 1999; Newman 2000; Pattillo-McCoy 2000; Small 2004; Venkatesh 2000; 2002), this research placed a large emphasis on the most marginalized areas of cities.

This emphasis played out within various communities of scholars focused on “neighborhood effects,” which also drew inspiration from Wilson’s description of concentration effects and neighborhood disadvantage (Sampson, Morenoff, and Gannon-Rowley 2002; Small and Newman 2001). Discussions of neighborhood effects subsequently emerged in a number of fields, including criminology, demography, education, social epidemiology, and sociology.

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3 Wilson (1987) is often cited for his use of spatial mismatch hypothesis to explain persistent unemployment in “ghetto” areas. It is important to note that Wilson revived a discussion that had existed since Kain’s work in the mid-1960s about the spatial mismatch between African Americans in the inner city and employment opportunities (Holzer 1991; Kain 1992). Kain’s initial work (1992), inspired by the 1965 Watts riots, has received much attention from economists, some of whom have found only minimal effects (e.g. Boustan and Margo 2009; Cutler and Glaser 1997). The balance of the empirical evidence, however, suggests that job access has large impact on the employment status of African Americans. This effect persists with some modest variation across cities (Holzer 1991; Kain 1992; Weinberg 2000).

4 This emphasis on structure has been pervasive within urban sociology since the rise of “culture of poverty” arguments in the 1960s, which were based on Oscar Lewis’s (1968; 1975) ethnographies and were epitomized by then Assistant Secretary of Labor Daniel Patrick Moynihan’s 1965 report on the African American family. Though Wilson (1987) has rejected the culture of poverty thesis, he has more recently joined others (Small, Harding, and Lamont 2010; Wilson 2010) in calling for a ‘cultural turn’ in urban sociology that embraces cultural analyses while rejecting the deterministic elements of earlier work.
Sometimes disparate, the neighborhood effects literatures have sought to quantify the effect of place on particular outcomes. Indeed, reviews of the neighborhood effects literature (Gephart 1997; Jencks and Mayer 1990; Sampson et al. 2002; Small and Newman 2001) have catalogued hundreds of studies that found impacts of place on such diverse outcomes as unemployment, poverty, crime, and educational attainment.

Similar reviews of neighborhood effects on health outcomes (see Diez-Roux and Mair 2010) have identified effects on mortality (Lochner et al. 2003), birth rates (Morenoff 2003), birth weight (Buka et al. 2003), asthma (Wright and Fischer 2003), infection disease (Fullilove 2003), obesity (Black and Macinko 2008; Kaczynski and Henderson 2008; Larson, Story, and Nelson 2009; Papas et al. 2007), diabetes (Auchincloss et al. 2007; Auchincloss et al. 2008; Auchincloss et al. 2009), and cardiac issues (Chaix 2009; Mujahid et al. 2008). Neighborhood effects, attributed to both the physical and social environments, have also been found on depression (Kim 2008; Mair, Diez-Roux, and Galea 2008). These outcomes have proved to be remarkably durable over time and in many cities, though they have not been without critique (Diez-Roux and Mair 2010). The neighborhood effects literatures have also hosted a number of critical conceptual and methodological debates that have considerable bearing on this project, including debates about how to define neighborhoods, selection bias, differentiating between composition and context, defining causal pathways, and effect heterogeneity. It is to these issues that I now turn.

**Operationalizing Neighborhood**

Among the most important debates generated by the neighborhood effects literature has been about how to define neighborhood for the purposes of social science research (Downey 2009).

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5 The neighborhood effects literature on mental illness other than depression is much smaller. Several reviews of the evidence of spatial effects on psychosis (Allardyce and Boydell 2006; March et al. 2008) found some indications of variation spatially in the rates of psychosis but were cautious in their assessment of these findings, noting that the literature suffers from methodological and conceptual issues. More recent work suggests that neighborhood effects may exist for nonaffective, but not affective, psychotic disorders (Kirkbride et al. 2014). There appear to be few if any studies of the effect of neighborhood on other Axis I and II disorders.
2006; Galster 2001; Hipp 2007). Neighborhoods are fluid concepts, encompassing not only physical space but also social meaning (Coulton 2012; Lee, Oropesa, and Kanan 1994). The socially constructed “imagined community” (Anderson 2006) that is each neighborhood makes formal measurement difficult for researchers. Administrative boundaries including zip codes and U.S. Census Bureau tracts are commonly utilized as proxies for such areas (Campbell et al. 2009; Hipp 2007; Sampson et al. 2002; Small and Newman 2001). These units are artificial designations created to facilitate the needs of the Census Bureau and the Postal Service, however, and typically do not coincide with resident conceptions of neighborhood boundaries (Campbell et al. 2009; Sperling 2012).

Though Census geography remains the traditional choice for boundary definition, researchers are increasingly adopting strategies for operationalizing neighborhood in ways that more closely align with the phenomenological constructions of spatial boundaries as well as the way individuals experience neighborhoods (Besbris et al. 2015; Campbell et al. 2009). Resident perceptions of place have been measured for decades and considerable variation in individual perception of boundaries, physical characteristics, demographic composition, neighborhood identity, and individual safety have been identified (Campbell et al. 2009; Coulton et al. 2001). Since social phenomena are located and these locations are themselves socially experienced (Logan 2012), perceptions of spatial boundaries may mediate the impact of place on individuals. Different approaches to neighborhood boundary operationalizing that take residents’ perceptions of boundaries into account are becoming more common, but tend to focus on small areas of cities (Campbell et al. 2009; Coulton et al. 2001; Kusenbach 2008). These methods may therefore be limited in their ability to address whole cities or multiple cities in a comparative design.

Other methodological approaches that may more accurately approximate neighborhoods as residents experience them are also being developed. Ego-centric or sliding approaches define neighborhood based on the use of street networks (Foster and Hipp 2011; Grannis 2005) or a set radius around a respondents’ home (Chaix et al. 2005; Grannis 1998; Guo and Bhat 2007;
Propper et al. 2005). Other studies have used alternate definitions of neighborhoods that rely on real estate boundaries for approximating neighborhoods (Albrecht and Abramovitz 2015; Besbris et al. 2015). These approaches require additional sensitivity analyses (Chaix 2009; Merlo 2003), but may identify more robust measures of association between ecological and individual measures (Chaix et al. 2005; Coulton 2012). This raises an additional issue for operationalizing neighborhoods - the selection of a unit of analysis, be it zip code, Census tract, or block group, has empirical as well as theoretical consequences. Different geographical levels of aggregation may have profound affects on statistical analyses using these aggregations (Hipp 2007; Sperling 2012), warranting caution and rigorous statistical testing when researches test different levels of aggregation for their models.

Composition, Context, and Selection Bias

The statistical relationships observed in the neighborhood effects literature have been critiqued not only for the way that neighborhood definitions affect them, but for what they are interpreted to represent by researchers. Much of the neighborhood effects literature is premised on the search for “contextual effects” (Macintyre, Ellaway, and Cummins 2002; Oakes 2004) – the factors outside of the individual that structure opportunity and health, such as labor and housing markets, social policies and the availability of services (Kawachi and Berkman 2003; Macintyre and Ellaway 2003). Unlike compositional measures (e.g. poverty, race), contextual factors provide an explanation “of how neighborhoods bring about a change in a given

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6 Such use of neighborhood boundaries derived from the real estate website zillow.com represents a unique approach to constructing neighborhood boundaries for analysis. Both projects are able to combine the strengths of a neighborhood definition rooted in individual experiences with existing administrative data sources such as the American Community Survey. While not widely adopted, such a strategy represents an important step towards neighborhood research that is rooted in the ways that neighborhoods are experienced by their residents or those who do business in them.

7 These statistical issues often fall under the umbrella of the “modifiable aerial unit problem” (MAUP; Gehlke and Biehl 1934; Openshaw and Taylor 1979; Waller and Gotway 2004). The essence of the MAUP is that statistical relationships when observed when individual data are aggregated into a particular higher-level unit often change in strength when the aggregated unit’s boundaries are altered.
phenomenon of interest” (Sampson et al. 2002:447). Oakes (2004) and others (Harding 2003; Hedman and Ham 2011; Sobel 2006) have challenged this premise, arguing that what is actually being measured is neighborhood composition. Often described as selection bias (Jencks and Mayer 1990; Mayer and Jencks 1989), this critique argues that neighborhoods are aggregations of individuals and any emergent effect is therefore endogenous to the neighborhood. Critics question, for example, whether individuals with poor health select into neighborhoods or whether neighborhoods themselves cause poor health. Researchers typically attempt to control for neighborhood composition in their statistical models as a way to isolate contextual effects from other factors (Sampson, Raudenbush, and Earls 1997; Sampson et al. 2002).

Several responses to these critiques, including by Diez-Roux (2004) and Sampson (2008), have discussed this issue in depth. Diez-Roux (2004) notes that multilevel epidemiological studies often include individual-level controls to attempt to account for selection bias, even though the inclusion of these variables may create residual confounding. Alternative models that move beyond attempts to account for selection bias have also been demonstrated, such as Harding’s (2003) assessment of how strong selection bias effects would have to be provide an alternative explanation for the relationships observed. These issues are intrinsically related to the shortcomings of observational data at the individual level (Winship and Morgan 1999), and raise concerns about how much of neighborhood variation in social status should or could be attributed to institutions or other external factors (Harding 2003).

Mechanisms, Pathways, and Levels

The causal issues raised by questions of composition, context, and selection bias may be addressed by providing evidence of how neighborhoods impact individuals rather than just the association between the two. Identifying the mechanisms and pathways that allow individuals to be connected with contextual factors is therefore an important and understudied element of neighborhood effects (Sampson 2013). Numerous studies have hypothesized various pathways between neighborhoods and individuals (Sampson 2011; Sampson et al. 2002), though the
empirical evidence supporting individual pathways varies greatly. Galster’s (2012) review of the pathways and mechanisms literature identifies fifteen major pathways covering a wide range of social outcomes. Various health specific pathways and mechanisms have been hypothesized (Macintyre et al. 2002; Macintyre and Ellaway 2003), including the presence and quality of social services and the area’s reputation among residents and service providers.

Models used to understand these mechanisms are typically estimated at multiple levels (Diez-Roux 2003; Subramanian, Jones, and Duncan 2003). These multilevel models allow individuals to be located within neighborhoods, and for both individual and neighborhood-level measures to be included in analyses. The specification of these multi-level regression models is not without drawbacks (Chaix et al. 2005; Diez-Roux 2004; Oakes 2004). Among these is the critique that multi-level models denude neighborhoods of their wider spatial context (Chaix et al. 2005). GIS and spatial statistics in particular have the ability to overcome this limitation (Diez-Roux and Mahir 2010; Moore and Carpenter 1999; Rushton 2003; Sampson 2012) but have been used only sparingly within sociology (Logan 2012).

Effect Heterogeneity

The literature on neighborhood effects has assumed overwhelming that such effects are represented by the “downward” statistical impact of particular neighborhood-level factors on an individual outcome (Sampson 2013). These models assume, often implicitly, a homogeneous effect of place on the particular outcome in question (Harding et al. 2011). Based on Sharkey’s (2006) study of the way urban youth navigate their neighborhood environments proactively to minimize the likelihood of confrontation, Harding et al. (2011) theorize that inner city youth determine (or have determined for them) the “dose” of neighborhood that they are exposed to. This variation in dose may occur through multiple mechanisms specific to family life and educational systems, leading some youth to have a more limited or greater exposure to the
elements of neighborhood structures that create educational disparities. By acknowledging that neighborhood conditions do not have the same impact on every individual who comes into contact with them, neighborhood scholars are forced to acknowledge not only the pathways through which place gets “under the skin” (Hertzman and Boyce 2010), but how these pathways and their impacts vary from person to person.

A Theory of Context

The issue of effect heterogeneity represents one element of Sampson’s more general criticisms of the assumptions involved in the statistical estimation of neighborhood effects. Sampson’s recent theorizing in both Great American City (2012) and his address to the American Criminology Society (2013) have focused on a reimagined neighborhood effects literature. In this recent work he has laid out ten principles that include a number of points that are salient for this project. Among these is a focus on multiple or mixed methods and an emphasis on the social psychological (i.e. shared cognition), organizational, and higher order mechanisms that cut across neighborhoods (2013:4-5). Sampson emphasizes a need to focus not only on individuals and neighborhood-level factors but the “downward and upward reaching influences” (2013:23) of place rather than solely focusing on the downward effect of neighborhoods on an individual. Above all, Sampson calls for a theory of “contextual causality” that exists at a level above the individual at the level of institutions, networks, shared cognition, and populations (2013:23-24). Institutions that work across numerous neighborhoods, such as public works departments and first responders like EMS providers, are an example of this. In Sampson’s view, they are both impacted by place (the “upward” effect) and impact neighborhoods themselves (the “downward” effect), serving both as the replicators and objects of neighborhood effects.

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8 This idea is not altogether different from Anderson’s (2000) conception of decent and street families, where certain characteristics of home life are connected with differential outcomes for youth. However, Harding and colleagues’ (2011) argument is distinctly broader, covering a wide variety of structural and cultural pathways that move beyond the limits of the family characteristics discussed by Anderson.
Social and Psychological Responses to Place and Illness

Sampson’s (2013) emphasis on social psychological responses to neighborhoods and shared cognition is part of a growing focus on how individuals respond to place. Much of this research has focused on issues like collective efficacy, social cohesion, and social psychological responses to disorder. Early Chicago School viewers of neighborhood crime patterns saw evidence of social disorganization (Shaw and McKay [1942] 1969), and though Whyte ([1943] 1993) argued that what looked at first blush like disorganization was not disorganization at all, and social disorganization has remained a present if problematic concept in criminology and urban sociology (Sampson 2012). The current emphasis on shared cognition, and the social psychological processes that constitute these views, is an outgrowth of this legacy. The literature can be roughly divided into a branch focused inward on residents’ views, and a branch focused outward at views others hold of neighborhoods.

The first branch of this literature has focused inward on residents’ views of particular neighborhoods that, though widely shared, may also vary greatly between cohorts of residents (Small 2004). These studies have included emphases on social cohesion (Buckner 1988; Sampson 1988; Stafford et al. 2003) and collective efficacy (Sampson 2012; Sampson et al. 1997). Rather than emphasizing strong ties among neighborhood residents, proponents of collective efficacy have stressed the importance weak ties between individuals (Freudenburg 1986; Granovetter 1973). Sampson (2012:159-161) finds that collective efficacy mediates the relationship between disadvantage and violence and disorder; communities that have weak levels of collective efficacy may have greater social fragmentation and higher rates of social disorder. Neighborhood disorder is a particularly important issue for understanding social psychological responses to place because the responses of outsiders to individual neighborhoods may be greatly impacted by signs of disorder. The totality of these responses results in what some have called neighborhood stigma (Chaix 2009; Sampson and Raudenbush 2004).

Neighborhood Disorder and Broken Windows
Unlike collective efficacy, social cohesion, and social fragmentation, which look inward at the shared beliefs of neighborhood residents, those who have analyzed neighborhood disorder have emphasized both the responses of residents and those who live outside of the neighborhood. Neighborhood disorder includes both social and neighborhood disorder (Ross and Mirowsky 1999). Social disorder includes “fights and trouble among neighbors and the presence of people hanging out on the streets, drinking, taking drugs, panhandling, and creating a sense of danger” (Ross and Mirowsky 1999:413). Physical disorder, on the other end, refers to the state of the built environment, focusing on the condition of buildings and the presence of such things as vandalism and graffiti (Ross and Mirowsky 1999:413). Causal associations between physical disorder and social disorder have been popularized as “broken windows theory” (Kelling and Coles 1996; Kelling and Wilson 1982), though the evidence linking disorder and crime is mixed (Corman and Mocan 2005; Kelling and Sousa 2011; Sampson 2012).

Despite this mixed empirical picture, the responses to disorder by residents, civil servants, and others are likely connected to both compositional and contextual factors (O’Brien and Wilson 2011; Sampson 2012) as well as larger structural factors (Sampson 2012:130-132). Race, disorder, and crime, for example, are commonly associated in American public perception (Bobo 2001; Quillian and Pager 2001), and race impacts individual evaluations of neighborhoods in the context of residential preferences (Jones and Jackson 2011; Krysan 2002; Krysan et al. 2009). Responses to disorder, therefore, may be difficult to disentangle from responses to race. Nevertheless, perceptions of physical and social disorder have been found to ultimately influence behavior of residents, who may change travel routines or label places as “no go areas” (Jones and Jackson 2011; Krysan et al. 2009; O’Brien and Wilson 2011; Sharkey 2006).

These responses may affect health as well. Out of seven studies identified by Diez-Roux and Mahir (2010) that analyzed the link between disorder and residents’ mental distress that the neighborhood-level, six identified positive relationships (Christie-Mizell, Steelman, and Stewart 2003; Dupéré and Perkins 2007; Latkin and Curry 2003; Natsuaki et al. 2007; Ross and Mirowsky 2001; Ross, Reynolds, and Geis 2000; Schieman and Meersman 2004). Responses to
disorder at the institutional level may be different because institutional actors may be unable to simply avoid particular neighborhoods as part of their jobs, though the content of these responses is largely unexplored (Sampson 2013).

**Stigmas of Status, Illness, and Place**

The ways in which physical and social disorder reach beyond individual behavior may reflect a stigmatization process associated with place (Chaix 2009; Sampson 2012; Sampson and Raudenbush 2004). Stigma has long been associated with the sociological study of mental health and certain physical disorders like obesity and HIV (Goffman [1963] 1986; Link and Phelan 2001; Major and O’Brien 2005). Stigma has also been identified as a fundamental cause of disparities in its own right (Krieger 1999; Meyer 2007; Poteat, German, and Kerrigan 2013). Link and Phelan (2001) identify the key elements of stigma as labeling, stereotyping, separation, status loss, and discrimination. Labeling has been given particular emphasis within the sociology of mental health (Link et al. 1987; Link 1982, 1987; Link et al. 1989; Rosenfield 1997), in part because of a “package deal” (Link et al. 1997) whereby individuals labeled as patients may receive access to medical care (Link et al. 1997; Corrigan 2004) but also may face stigmatized responses from medical providers (Desai et al. 2002; Druss et al. 2000; Link, Mirotznik, and Cullen 1991). Moreover, individual, community, and institutional factors contribute to these elements (Pescosolido et al. 2008), and several stigmatized conditions may intertwine in ways that some have termed multiple (Crandall 1991; Rush 1998) or intersectional stigmas (Collins et al. 2008; Logie et al. 2011).

Neighborhoods may also serve as labels applied to individuals (Lalli 1992; Macintyre et al. 2002; Uzzell, Pol, and Badenas 2002). Given that neighborhood labels are applied in ways that are generalized to most residents (i.e. stereotypes) and lead to the acts of individual and institutional discrimination (Bauder 2001; Bauder 2002; Dean and Hastings 2000; Newman 2000; Taylor 1998; Wacquant 1993; Wacquant 2008), extending discussions of stigma to place appears theoretically justified (Chaix 2009; Galster 2012). Such spatial or “territorial
stigmatization” (Wacquant 1993), however, has received little empirical assessment (Besbris et al. 2015; Chaix 2009; Galster 2012), particularly in terms of widespread studies designed to estimate the effect of neighborhood on behavior. The recent paper by Besbris and colleagues (2015), which found that individuals are less likely to respond to online advertisements from disadvantaged neighborhoods, is one of the only such studies. Furthermore, no studies have analyzed neighborhood stigma and health (Chaix 2009) even though the concept provides a vehicle for understanding how institutional actors may respond to neighborhoods, perpetuating place-based disadvantage and inequalities in health outcomes (Macintyre et al. 2002).

The combination of stigmatized social status and marked space is particularly evident in the literature on homelessness. The experience of homelessness is the United States is paradoxically framed both by pity (Link et al. 1995; Meanwell 2012; Phelan et al. 1995; Phelan et al. 1997; Toro and McDonell 1992; Toro et al. 2007) and stigmatization (Link et al. 1995; Meanwell 2012; Phelan et al. 1997). This stigmatization spills into everyday interactions between homeless individuals and peers, service providers, and members of the public (Anderson, Snow, and Cress 1994; Roschelle and Kaufman 2004; Snow et al. 1986; Snow and Anderson 1993). One complicating factor with these interactions is the assumption that homeless individuals have either mental health or substance use issues (or both), a common belief (Fischer and Breaky 1991) that many have argued is overstated (Lyon-Callo 2000; Mathieu 1993; Snow et al. 1986) though these are certainly issues for some (Bourgois and Schonberg 2009).

This association with negative traits, including not only mental illness and substance use but also panhandling (Duneier and Molotch 1999; Lankenau 1999a; Lankenau 1999b; Lee and Farrell 2003), and criminality (McCarthy and Hagan 2005), can lead to protests over the presence of homeless individuals in certain areas of cities (Snow and Mulcahy 2001). Following Duncan (1983) as well as Snow and Anderson (1993), it has become common to separate urban

9 The sociological literature on homelessness is wide and varied (see Lee, Tyler, and Wright 2010, Meanwell 2012, and Shlay and Rossi 1992 for reviews). Meanwell (2012) breaks the literature down into a number of major groups, including the stigmatization of homelessness, the experience of homelessness, and the interactions individuals who are homeless have with shelters and other social service agencies.
areas into primary and marginal spaces (DeVerteuil, May, and von Mahs 2009; Snow and Mulcahy 2001; Stuart 2014). Primary spaces are those areas that are populated and socially constructed for domiciled individuals, whereas marginal spaces are areas of cities with little to no economic, public, or symbolic value where homelessness may be tolerated. Snow and Mulcahy (2001) add a third type of space, transitional, to refer to buffer zones or areas targeted for reclamation by cities. Marginal spaces have become areas in which sociospatial exclusion is practiced (DeVerteuil et al. 2009), allowing police to clear or “purify” (Stuart 2014; von Mahs 2005) primary spaces for the benefit of the domiciled public. Such spatial conflicts illustrate the broader ways in which urban space becomes socially constructed for the benefit of one group or another and, more broadly, defined by its primary users.

**Contextualizing Work**

Shared cognition of these issues, including views of disorder, stigmatized illness or social status, and neighborhood stigma, can be conceptualized as knowledge that is used by residents to navigate the urban physical and social landscapes. Sharkey (2006) describes this “street efficacy” – the knowledge youth use to avoiding conflict and staying safe. Moving conceptually beyond the level of individual residents to EMS providers and others whose work in citywide institutions cuts across neighborhoods, knowledge becomes a tool not just for navigating city streets but also for functioning on the job. Sociologists of work have long been interested in how both formal and informal knowledge function in the workplace (Bechky 2003), though this interest has not extended to spatial knowledge or a wider interest in the spatial context of work. As with neighborhood views, knowledge in the workplace is “constructed in a particular social context” (Bechky 2003:313). Individual knowledge about work is therefore situated both

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10 The one exception here has been the literature on the spatial mismatch hypothesis, though this has received more attention from urban and race scholars than those interested in work. Generally speaking, the work literature has ignored spatial context. This inattention to space and place is not an anomaly but rather a constant across a number of sociological subfields (Gieryn 2000; Logan 2012; Spain 2014).
within an organizational context as well as within an “occupational community” (Van Maanen and Barley 1984).

**Occupational Communities and Spatial Constraints on Work**

Occupational communities – also called communities of practice (Brown and Duguid 1991; Duguid 2005; Fox 2000; Kellogg, Orlikowski, and Yates 2006; Østerlund and Carlile 2005) or communities of knowledge (Boland and Tenkasi 1995) – describe the process of knowledge transmission within the workplace (Bechky 2003; Peltonen 2007; Van Maanen 2010; Van Maanen and Barley 1984). Through occupational communities, employees “acquire a particular community’s subjective viewpoint and learn to speak its language” (Brown and Duguid 1991). These viewpoints not only structure how employees view the work that they do, but also the wider world that work occurs within (Bechky 2003; Orr 1996). The occupational community perspective is therefore ideal for developing an understanding of how employees make meaning out of their work and the context within which this work occurs. Further, it provides an explanation about how these meanings become shared throughout a workplace or profession.

Occupational communities have been identified in a wide variety of occupations and workplaces. In addition to Orr’s (1996) seminal study of copier repair technicians, occupational community has been used to analyze manufacturing plants (Bechky 2003), web design firms (Kellogg et al. 2006), middle managers in a variety of settings (Peltonen 2007), and software developers (Marschall 2012). It has also been applied in health care settings, including with various types of nurses (Aydin 1989; Bolton 2005; Wooten and Crane 2004) and pharmacists (Aydin 1989). In these health care settings, occupational communities have been used to describe how professional norms related to the practice of medicine become shared values.

**The Temporal and Spatial Context of Work**

These norms and shared values that constitute occupational communities occur in workplaces that are also structured both temporally (Perlow 1999) and spatially (Orr 1996; Van
Maanen 2010). Perlow’s (1999) sociology of work time (see FIGURE 2.2, p. 255) provides both theoretical framing and empirical support for the ways in which work is temporally structured. She purposes a triangular model that connects both the social and temporal contexts of work to the structure of interdependent work patterns. In doing so, she draws upon Giddens’ (1984) theory of structuration and his discussion of institutional time (or institutional durée). Giddens describes this as the wider trajectory of institutions within which individual experiences and time patterns are situated.

Though Perlow does not engage with Giddens beyond this point, his theory of structuration provides potential for understanding the wider impact of space and place. Giddens draws heavily upon the ideas of Hägerstrand’s (1976) concept of time-geography. Giddens argues that social phenomena are both temporally and spatially located. Thus, a deeper engagement with both Perlow and Giddens has the potential to better situate our understanding of work within its broader spatial and temporal contexts. Such a focus may also have ramifications for the concept of occupational communities, which has engaged with space only as a complicating factor for managing geographically dispersed, highly mobile workers like law enforcement (Van Maanen 2010) and copier repair (Orr 1996).

Though it has not been documented empirically, knowledge about neighborhoods – including place-based stigma – is the type of knowledge that could be transmitted through occupational communities. An occupational community within EMS work may therefore represent an opportunity to transmit not just professional norms about the practice of medicine but knowledge about particular types of neighborhoods and patients that may be stigmatized by the community of providers. More generally, focusing on the wider temporal and spatial contexts of is a particularly important undertaking given the major structural shifts in work towards both flexible employment (Kalleberg 2000; Kalleberg 2009) and flexible workspaces such as “innovation labs” or “innovation spaces” (Lewis and Moultrie 2005; Magadley and Birdi 2009) that disrupt well established temporal and spatial norms of workplaces.
Health Care Practice

Beyond the shared knowledge that is a core part of health care occupations, there are other characteristics of health care practice that are critical for understanding urban Emergency Medical Service work and the perpetuation of inequalities in health outcomes. Interest in health care work has been a core component of medical sociology (Bloom 2002). Early work like Howard Becker’s (Becker et al. 1976) set the stage for a wider investigation into the professions from sociologists primarily interested in the structure of work and occupations. In addition to studying physicians (Becker et al. 1976; Bosk 2003; Friedson 1988), sociologists have also taken an interest in nursing (Chambliss 1996), medical assistants (Scarselletta 1997), and various units in hospitals including emergency departments (Timmermans 1999) and neonatal intensive care units (Anspach 1997). Yet, in-spite of this widespread interest in health care occupations as well as significant impact that Emergency Medical Services providers have on patient care trajectories (IOM 2007a; Mannon 1992; Metz 1981), EMS work with patients has received little attention from researchers.

Inequalities in the Clinical Encounter and Clinical Care

An essential element of research on health care work has been identifying inequalities in the clinical encounter, which may serve to perpetuate larger inequalities in health outcomes (IOM 2003; Williams et al. 2010; Wright and Perry 2010). Once a common explanation for health care disparities (Wright and Perry 2010), it has fallen out of favor because analyses have shown that the effect of care on mortality is minimal, perhaps in the range of 10% (McGinnis, Williams-Russo, and Knickman 2002), and because of the bourgeoning interest in the social determinants of health (Berkman and Kawachi 2000; Link and Phelan 1995). Yet the clinical encounter is an important element in health care, and there have been recent calls for a renewed focus on how doctor-patient relationships contribute to inequalities in outcomes (Williams et al. 2010). These inequalities may stem from flawed medical knowledge as well as biases held towards either groups of individuals or particular types of patients.
Providers of all levels bring a range of beliefs, knowledge and experiences to the clinical encounter. Importantly, providers’ decisions during the clinical process are not solely based on biomedical factors, but social factors as well. Timmermans’ (1999) work on the use of cardiopulmonary resuscitation (CPR) and Advanced Cardiac Life Support (ACLS) in Emergency Departments reveals the degree to which providers’ clinical understandings of a patient are affected by that patient’s social position. Timmermans concludes that the answer to the question of “how sick is this patient?” has biomedical as well as social facets.

These issues have best been studied with respect to racial inequalities in the clinical encounter, a focus epitomized by the Institute of Medicine’s (2003) wide-ranging report. However, the IOM’s report did not cover disparities in emergency departments despite evidence that inequalities exist there as well (Cone et al. 2003). The emergency department literature is featured here due to the lack of an analogous literature on EMS care. In EDs, racial disparities have been found in cardiac arrest management (Becker et al. 1993; Cowie et al. 1993) and chest paint treatment (Ghali et al. 1993; Johnson et al. 1993; Pezzin et al. 2007). There is mixed evidence for racial disparities in pain management in the ED (Cone et al. 2003), with some studies finding that racial and ethnic minorities have been undertreated compared to whites (Lee, Burelbach, and Fosnoct 2001; Pletcher et al. 2008; Todd, Lee, and Hoffman 1994; Todd, Samaroo, and Hoffman 1993) while others have found no difference by race or ethnicity (Fuentes, Kohn, and Neighbor 2002).

Medical knowledge rooted in misconceptions about the links between social status and health is one way in which the clinical encounter may reproduce inequalities in health outcomes such as those described above. For example, health care providers as well as health researchers continue to reproduce the idea that race, genetics, and health outcomes are intrinsically linked in-spite of limited evidence for this conclusion (Cooper, Kaufman, and Ward 2003; Williams et al. 2010). An example of this is the slavery hypothesis, which posits that elevated rates of hypertension are due to a process of genetic selection among African Americans resulting from
the experience of the slave trade (Kaufman and Hall 2003). These beliefs are particularly problematic because of the potential impact such knowledge may have on decisions about the efficacy of particular treatments. Williams and colleagues (2010) cite a 2005 survey showing that “81% of physicians believed that race should be used as a biological basis for determining diseases and 85% indicated that drugs targeted toward specific ethnic and racial groups may have therapeutic advantages” (2010:86). Indeed a wide variety of medications (Cooper et al. 2003:1166-1167; IOM 2003:138-139; Wilson et al. 2010:86-87) have been claimed at various points in recent history to work better for one group or another. However, the preponderance of evidence suggests that few of these claims withstand rigorous empirical testing (IOM 2003:138-139).

Differential care may also be the result of conscious or unconscious bias among providers. Such care may not be malicious, but is deeply problematic. The IOM (2003) has identified a number of studies with physicians where they were asked to recommend care for a patient portrayed in a vignette. Several of the studies showed that providers were less likely to recommend care for African Americans and, in some cases, women (Abreu 1999; Rathore et al. 2000; Weisse et al. 2001). Additionally, providers in some studies have been asked about whether certain types of patients were likely to follow instructions, abuse substances or not comply with treatments. These studies found that African Americans were rated by providers as less likely to comply with treatments and more likely to abuse substances (van Ryn and Burke 2000). The IOM cautioned, however, that none of the research available to them was able to show widespread discriminatory beliefs among providers nor were they able to untangle conscious and unconscious bias (IOM 2003:162-174).

Commonly cited in peer-reviewed literature, medical texts and in the popular media, the slavery hypothesis provides an explanation for the elevated rates of hypertension among African Americans (Kaufman and Hall 2003). Proponents of the hypothesis argue that those who were brought to the New World were exposed to exceptional heat and both water and sodium deprivation during the trans-Atlantic trip. This experience, it is argued, created a genetic predisposition to stress and sodium that manifests as hypertension among many African Americans (Kaufman and Hall 2003; Williams et al. 2010:86-87). The hypothesis has been subject to scathing historical and methodological critiques, yet continues to be used within medicine as evidence connecting race and genetics (Kaufman and Hall 2003).
Provider views about patients being difficult or non-compliant also extend to patients with socially stigmatized illnesses, including substance use disorders and mental illness. In these cases, health care providers may stigmatize patients if the patient’s symptoms or behaviors are not seen as resulting from a legitimate condition (Breeze and Repper 1998). Sociologists have long documented the labeling process for “difficult patients” (Brown 1989; Leiderman and Grisso 1985; Shem [1978] 2010). In Emergency Departments, “good patients” are distinguished from “bad” ones (Jeffery 1979; Roth 1972). The providers that work with these “bad” patients are seen as performing “dirty work” (Brown 1989), and their patients seen as “less deserving of treatment” (Skinner et al. 2009). Providers who engage in this work may derive less satisfaction from it, question its value, and exhibit higher rates of burnout (Brown 1989). Patients of providers who are dissatisfied with their job also have poorer clinical outcomes (Glisson and Durick 1988; Glisson and Hemmelgarn 1998; Glisson and James 1992).

Moreover, these views can also be reinforced by the peculiarities of clinical practice since patients are not randomly distributed among health care practices and hospitals. The concept of the “clinician’s illusion” (Cohen and Cohen 1984) describes this phenomena and the resulting bias whereby providers believe that their own biased sample represents the wider population of patients from which it is drawn. The clinical encounter is thus a site for producing and reproducing unequal outcomes across a variety of physical and mental health issues.

Social Science Perspectives on EMS Work

Though the work and care provided in emergency departments (EDs) has received attention from social scientists interested in disparities in acute care (Coontz, Lidz, and Mulvey 1994; Friedman et al. 1981; Lincoln 2006; Lincoln et al. 2010; Lindsey and Paul 1989), the pre-hospital acute care delivered by the Emergency Medical Services system has received comparatively little attention from sociologists and other social scientists. Some focus has been given to patient level predictors of the use of EMS services by particular populations (Joyce, Brown, and Nelson 1996; Shah et al. 2003; Shah et al. 2007; Shah et al. 2008) as well as the
“misuse” EMS services (Ruger, Richter, and Lewis 2006), particularly in European contexts (Hjalte et al. 2007; Snooks et al. 2004; Snooks et al. 1998).

Little time, however, has been spent understanding pre-hospital medicine from the perspective of the EMS providers themselves. The limited literature on EMS work suggests that they frequently work with patients who providers find frustrating and who may have socially stigmatized conditions (Mannon 1992; Metz 1981; Patrick 2005). Patrick, a journalist, provides the only contemporary overview of urban EMS work. The two seminal studies of EMS work – those by Mannon (1992) and Metz (1981) - illustrate the state of pre-hospital medical care in the late 1970s. Mannon’s ethnography is the most relevant of the two, emphasizing the “street level social work” aspect of EMS care as a large if informal element of EMS work. Much of the more recent work by social scientists has focused on the relationship between EMS providers and health care practitioners. Several accounts (Palmer 1983; Palmer and Gonsoulin 1990) have shown how providers have attempted to carve out an occupational niche for themselves with varying degrees of success, largely inhibited by the trappings of EMS work’s amateur past (Whalley and Barley 1997; see CHAPTER 1, p. 13). Negotiation between Paramedics and other health care providers has been documented as a key part of this process (Mellinger 1992; Mellinger 1994; Palmer 1989). Negotiation between Paramedics and others at emergency scenes, including law enforcement, families, and bystanders, has also been described in a recent study of scene management by Canadian EMS providers (Campeau 2008).

This past focus on the occupational conditions of EMS work raises many questions for further exploration, yet there have been few studies of contemporary EMS work since the 1980s and early 1990s (see Campeau 2008; Henckes and Nurok forthcoming; Prener and Lincoln forthcoming for the only recent examples). Since that time, the operational and clinical capacities have greatly expanded. So too has the formal occupational mandate of EMS providers, with the threat of terrorism, hospital overcrowding, and steadily declining numbers of ED and inpatient beds greatly changing the landscape of EMS work. In spite of these changes, the EMS system remains an understudied element of the health care system from both social science and
clinical standpoints. There is little empirical evidence to justify the operational arrangements and clinical interventions that occur in the pre-hospital setting, and little is known about the impact that EMS work has on patients or providers (IOM 2007a). While other first responder occupations, such as fire fighting (Chetkovich 1997; Desmond 2007; Pacholok 2009; Regehr, Goldberg, and Hughes 2005; Shreffler, Meadows, and Davis 2011; Ward and Winstanley 2006; Yoder and Aniakudo 1997), search and rescue work (Lois 2003), and law enforcement (e.g. Van Maanen 2010) have all received recent if limited attention, the study of Emergency Medical Services has languished.

Towards a Contextual Theory of EMS Work

Since EMS work occurs in the community, the ways in which neighborhood context and conditions impact the provision of pre-hospital medical care is a glaring question. The large literature on neighborhood effects across a wide range of social and health outcomes suggests that place matters, yet the theorized mechanisms through which this occur lack empirical support. By exploring the ways in which EMS providers can contribute to health outcomes by mediating the connection between place and individuals, there are opportunities to expand both our understanding of how neighborhood effects as well the ways in which work is affected by where it takes place. Finally, this project presents the opportunity to continue my previous work (see Prener and Lincoln forthcoming) looking at the ways in which the EMS system is particularly important for linking marginalized populations, such as individuals who have mental illnesses, substance use issues, and who are homeless, to clinical care. The literatures on these issues, summarized above, provide the theoretical and empirical basis for the research questions posed in the CHAPTER 1 (see pp. 18-19) as well as motivation for the research methods I selected for this project, a topic that I turn to in the next chapter.
CHAPTER 3: Data & Methods

The research design I utilized for this project was conceived from the outset as a mixed methods design. This was particularly appropriate given the limited nature of the literature on Emergency Medical Services (see CHAPTER 2, pp. 45-47). My mixed methods approach allowed for the exploration of new concepts and themes as they emerged, particularly from the fieldwork phase of data collection. At the same time, it also allowed for the inclusion of quantitative and spatial data that was readily available from a variety of sources. The qualitative fieldwork and interview data formed the methodological “core” of the study, while “supplemental” quantitative and spatial data were used to bolster those qualitative data (see TABLE 3.1, p. 256). A key element of the research design was the mixed analysis of data, which is a much rarer approach within mixed methods research (Small 2011). The mixed analysis, in the form of GIS mapping¹ and spatial statistics, supplemented more traditional qualitative and quantitative techniques.

This chapter has three main sections that describe this research design in more detail, the various data sources used, and the general data analysis techniques used for the qualitative,

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¹ GIS, as it is used here, stands for “Geographic Information Systems”. These are computer software programs designed to store, manipulate, and visualize georeferenced data. GIS programs also allow users to compute spatial statistics that illustrate the statistical relationships between these spatial data.
quantitative, and spatial data. These sections are followed by a discussion of the human subjects concerns that are present in this research, particularly as they related to the use of GIS techniques in confidential research sites. Before describing this research design, however, I begin by providing some discussion of my participant-as-observer (Adler and Alder 1994) role in the field.

**Positionality, Research Roles, and EMS Experience**

Methodological reflexivity is increasingly considered a requisite element of any social science research regardless of the method employed. Critical theorists, particularly feminists, have emphasized the importance of acknowledging both the power relationships inherent in research (Harding 1991) and the particular positions of researchers (McDowell 1992), including the identities and past experiences that researchers bring to the field. As with others who have recently undertaken research with first responders (Desmond 2007; Lois 2003), this project’s beginnings are rooted in my own EMS work experiences. From 2004 until 2008, I worked as an Emergency Medical Technician (EMT) with three different first responder agencies in New York State. These three agencies covered a wide spectrum of EMS work environments, and included a “third service” (i.e. EMS only) agency, a Fire Department that also provided ambulance services, and a University EMS service. Additionally, from 2002 to 2006 I worked as an EMS Dispatcher for the “third service” agency that I was affiliated with.

These experiences, particularly working in mixed income suburban and rural areas and in treating patients for substance use, served as the inspiration for the previous pilot research (Prener and Lincoln forthcoming). Though I had not worked in urban areas similar to those that I studied, my experiences fulfilled the prerequisites for establishing peripheral membership (Adler and Adler 1987) within the EMS community as a former participant, allowing for an

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2 For equivalent, non-first responder experiences, see Mears’ (2011; 2013) accounts of her work as a model prior to her dissertation fieldwork. Similarly, Wacquant’s (2004) entry into the world of boxing was unrelated to an interest in studying prize fighting and only became a research site itself after some time (see Wacquant 2011).
insider’s view of EMS work without fully participating as an EMS provider. During both our pilot study and this project, my participant-as-observer role in the field (Adler and Adler 1994) eased the processes of gaining access to the research site and establishing rapport with providers. Though EMS providers occasionally assumed knowledge on my part (saying “you know how it is”), being able to converse with providers about shared experiences using a common vernacular outweighed any drawbacks to being open about my past experiences as an EMS provider. This alignment of a researcher’s habitus (Bourdieu 1990) with the acquired tastes and dispositions of those in research sites has been identified as a particular strength for field researchers in a variety of settings (Mears 2013; Wacquant 2004; Wacquant 2011).

Research Design

The qualitative fieldwork that benefited from my previous experience as an Emergency Medical Technician was one part of a larger research design that leveraged a number of innovative approaches to data collection. These tools, including an explicit mixed methods approach to data collection and analysis, the implementation of qualitative GIS techniques, and the use of mobile devices for data collection, are key elements of my general approach to research and fieldwork that deserve attention before describing the specific data sources and analytical tools that I used.

Mixed Methods Design

Mixed methods research designs are not conceptually new, though they have received limited attention in both sociology (Small 2011) and pre-hospital medicine (McManamny et al. 2015) until recently. This stands in contrast to the well-known divisions within the social sciences between proponents of qualitative and quantitative methods (Collins 1984). As the literature focused on mixed methods has begun to expand (Small 2011), one central debate has focused on what precisely constitutes mixed methods research (Griffin and Ragin 1994; Small 2011; Tashakkori and Teddlie 2010). Small (2011) argued that studies could mix methods on
three axes: data, data collection, and data analysis. Studies that collect multiple types of data, use more than one mode of collecting primary data, or analyze data using two or more alternate analytical techniques would all be considered mixed methods under this broad definition. The research design presented here (see FIGURE 3.2, p. 257) utilized all of these approaches to mixed methods to varying degrees.

The overall research design for this project was split into two distinct elements: a “core” qualitative body of data and a “supplementary” quantitative body of data. The distinction drawn between these two elements of the project is common within mixed methods research (Morse 2010; Morse and Niehaus 2009). Designating a “core” set of data indicates that these data are intended to stand on their own, whereas “supplementary” data are often incomplete in some way or hampered by shortcomings that would prevent them from comprising a full-fledged analysis (Morse 2010). In this project, qualitative data were designated as the “core” component because of longstanding concerns about the availability and quality of the EMS patient data (IOM 2007a) that were originally intended to comprise the “supplemental” data.3

The “core” qualitative data for this project had three “strands” (Morse 2010): (1) neighborhood observations includes unstructured field notes collected in each of the Census Block Groups in Chapman City (QUAL-A in FIGURE 3.2, see p. 257), (2) EMS shift observations consisting of semi-structured and structured observations of Private Ambulance shifts (QUAL-B), and (3) semi-structured interviews with EMS providers at Private Ambulance (QUAL-C). Each of these strands contained additional spatial references that made linkages between the data and shared GIS analysis possible. The “supplemental” quantitative data were divided into three strands as well: (1) Chapman Police Department “calls for service” data that served as a

3 Due to data access issues, the scope of these proposed analyses had to be paired back and, in their final form, comprises a more limited dataset than originally envisioned in the dissertation proposal. These types of access issues are among the reasons that the quantitative data were designated as “supplemental” in the research design.

4 “Strands” refer individual components of the research design that have their own conceptualization, individual samples, data collection, and analysis techniques. These are typically conceived of as dedicated either to qualitative or quantitative data. Strands are referenced here using formal mixed methods notation (see Morse 2010).
proxy for EMS demand in the absence of patient-level records (quan-a), (2) neighborhood statistical data drawn from a number of sources including the 2010 U.S. Census, the 2008-2013 American Community Survey, and a variety of publicly-available local data sources (quan-b), and (3) a geo-database of spatial features and data for the City of Chapman joined with spatial data derived from the various qualitative and quantitative strands (gis).^{5,6}

**Qualitative GIS**

The inclusion of GIS in the research design, and the collection of spatial data in qualitative settings, deserves some additional explanation. Two forms of qualitative GIS techniques, sketch mapping with individual participants (Boschmann and Cubbon 2014; Brennan-Horley and Gibson 2009; Cieri 2003;) and the geocoding of ethnographic data (Gravlee et al. 2006; Matthews et al. 2005), were utilized in this study. These techniques were integrated as supplementary, concurrent processes into each of the “core” qualitative data strands (see FIGURE 3.2, p. 257).^{7} A mixed methods approach to research that includes GIS techniques is

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5 A major issue for mixed methods research is the temporal sequencing of these strands (Morse 2010), though this is often of greater interest for mixed methods researchers than others. This study contains both simultaneous and sequential elements. Broadly speaking, the qualitative and quantitative bodies are simultaneous (QUAL + quan, in formal mixed methods notation [see Morse 2010]). Within the qualitative body of data, there are both simultaneous and sequential elements. The neighborhood observational data have been collected and analyzed simultaneously alongside the qualitative EMS data. However, the qualitative EMS data themselves are sequential with the collection and initial analysis of the EMS observations occurring prior to the collection of the interview data (QUAL-A + [QUAL-B -> QUAL-C]). All of the quantitative data strands have been collected and analyzed simultaneously (quan-a + quan-b + gis).

6 The abbreviation for GIS strand of data analysis, gis, is my own notation. There is no discussion of GIS techniques in Morse (2010), whose work informs the use of these abbreviations. As the subsequent section ‘Qualitative GIS’ in this chapter notes (see pp. 52-54), there is a distinction between qualitative and quantitative data in GIS research. It therefore seemed in appropriate to designate the GIS strand of data analysis solely as ‘quan’ or ‘qual’ in this project, particularly given that a good deal of the spatial data generated was gathered using qualitative techniques but were analyzed quantitatively.

7 While strands are often discussed with reference to their sequencing (see Morse 2010 as well as footnote 5 above), the mixed data collection process used means that sequencing is also a consideration within strands. In this case, spatial data were collected through the qualitative strands of the research design, making this a concurrent data collection process. As with the quantitative strands, these were considered supplementary rather core data elements.
beginning to become more common within sociology, though there remain both conceptual and methodological challenges to their inclusion in sociological research designs (see Logan 2012).

The growing literature on mixed methods research in the social sciences has often ignored GIS techniques regardless of their qualitative or quantitative orientation. Tashakkori and Teddlie’s (2010) otherwise seminal Handbook of Mixed Methods in Social & Behavioral Research gave only passing attention to GIS techniques. They were described in terms of their ability to assist with data visualization (Dickinson 2010), but received little attention beyond that. Separately, there is a more robust mixed methods debate within geography, where there has been a similar divide between quantitative and qualitative approaches. Within the GIS community, there has been a small but growing cohort of researchers utilizing “qualitative GIS” techniques (Cope and Elwood 2009). Much as qualitative research within sociology positioned itself as an epistemologically distinct entity, qualitative GIS was an outgrowth of feminist geography’s critiques of what they perceived as an overwhelmingly positivist orientation within geography (Pavlovskaya 2009). Qualitative GIS was therefore an attempt to integrate the complexities of individuals’ lived experiences into GIS analyses (Dorling 1998; Kwan 2002).

Though qualitative GIS represents an additional and increasingly common means for mixing data collection and analysis strategies, it remains an unfamiliar approach to most researchers outside of geography and there has been little adaptation within sociology. Matthews and colleagues (2005) represent one of the few attempts to integrate qualitative data and ethnography, though their research was not specifically described as qualitative GIS (they opted to coin their own term, “geo-ethnography”) and there were minimal connections developed between their efforts and the wider field of qualitative geography. Within geography, the predominante approach to integrating qualitative and spatial data has been through techniques known alternatively as “mental mapping” and “sketch mapping”. These terms have often been used interchangeably, though there have been recent attempts (Boschmann and Cubbon 2014) to formalize distinctions between the two. Sketch mapping, the technique utilized in this study, uses a pre-existing, cartographically accurate base map to guide spatial data collection where the
goal is to understand the distribution of activities or perceptions of space (see FIGURE 3.3, p. 258, for an example of the sketch map used in this project). Rather than being the sole form of data collected, sketch mapping is typically a supplementary activity alongside focus group (Dongus et al. 2007; Fielding and Cisneros-Puebla 2009; Sletto et al. 2010; Weiner and Harris 2003; Wridt 2010) or interview data (Brennan-Horley and Gibson 2009; Cieri 2003). The digitization of these data and subsequent GIS analysis is an important part of the analytic process, and individual or group data are often aggregated into composite maps to demonstrate where perceptions or activities “cluster” in a particular place.

My use of geocoding represented a deviation from the common approach to mixed methods research design that defines a strand as a single mode, either qualitative or quantitative, of data collection. Rather, geographic data in this project was a specific aspect of each data strand regardless of its overarching methodological orientation. Geocoding was thus part and parcel of each aspect of the data collection process, and GIS analyses could be conducted on data collected from any strand of the study. This shared spatial property of the data was enabled by the use of a common unit of analysis - the Census Block Group. All of the data collected in the various strands were gathered in such a way that they could be aggregated up to the Census Block Group. This represents what I term a spatial common denominator. The use of such a common spatial unit meant that each element of the spatial data could be easily integrated with the others, ensuring a seamless analysis regardless of the source.

Mobile Data Collection

The integration of qualitative GIS data into the ethnographic strands (QUAL-A and QUAL-B) required another nascent methodological technique - mobile data collection. Mobile data collection was an outgrowth of several trends within social sciences research that capitalized on hardware and software tools to augment the data collection process. Large scale surveys such Current Population Survey (CPS; Couper 2000), the General Social Survey (GSS; Smith and Kim 2003), and the National Health Interview Survey (NHIS; NCHS 2010) have relied on computer
assisted personal interviewing (CAPI) techniques to aid interviewers during data collection for nearly two decades. The growth in mobile devices in recent years has given researchers the ability to take CAPI techniques out of the call center and into the field. In settings where CAPI techniques are infeasible, inappropriate, or undesired, mobile devices allow researchers to conduct face-to-face interviews while availing themselves of the accuracy and data entry strengths of a computer-based approach (Forster et al. 1991; Gravlee 2002; Gravlee et al. 2006; Patnaik, Brunskill, and Thies 2008; Shaw et al. 2011). Mobile CAPI (“MCAPI”) techniques, however, have largely been deployed in studies in the global south. There has also been little legacy of the use of MCAPI by sociologists, with Gravlee’s (2002; Gravlee et al. 2006) neighborhood research in Detroit one of the only examples of sociological research using MCAPI methods.

MCAPI techniques in this study represented the key to collecting spatial data in the field. The collection of these data was enabled by the widespread integration of Global Position System (GPS) hardware into smartphones. These chips have accuracy levels that are roughly equivalent to consumer-grade, standalone GPS devices (Zandbergen 2009; Zandbergen and Barbeau 2011), though they are not as accurate as commercial-grade GPS devices used in surveying applications. Error rates for mobile devices’ GPS chips are typically found to be within 5.0 to 8.5 meters (Zandbergen and Barbeau 2011). These error rates mean that some minimal cleaning of the spatial data, particularly point data, is often required. There are now a number of software applications available that leverage the presence of GPS chips in smartphones and allow for the collection of geocoded data. This study used three different applications that blended commercially available mobile applications with custom data solutions to collect point (latitude/longitude), travel route, and Census Block Group data in the field. These individual applications are discussed more specifically in the following “Data Sources” sections (see pp. 56-64). Taken together, they represent the cutting edge integration of technology into the collection of mixed methods data rather than solely the analysis of these data.
**Data Sources**

*Neighborhood Observations (QUAL-A)*

The first “core” strand of qualitative consisted of visits to each of the City of Chapman’s approximately 90 Census Block Groups between August 2013 and September 2014. Visits were completed either on foot or by bicycle and included notations about each block within the Block Group. Field notes included descriptions of the housing stock within the block, the presence of any businesses visible from the street (as indicated by signs or storefronts), and the presence of signs of ‘disorder’ including graffiti, the presence of individuals who appeared to be homeless or signs of their presence (encampments, belongings), vacant buildings, and empty alcohol bottles. The goal of these observations was to capture these Block Groups as close to their conditions in December, 2013 as possible. In order to achieve this, data collected was checked against an online database of city building permits to exclude development projects that began after December, 2013 when EMS shift observations were completed.

Data from these observations was collected using an iPhone-based database solution named FieldWerks (see FIGURE 3.4, p. 259) that I built specifically for this project. Field notes created using FieldWerks included text describing the location associated with the note, the latitude and longitude of the location, and in some cases one or more photos of the location. Individual notes were synthesized to create qualitative profiles of each Census Block Group, which were then combined with neighboring Block Groups to create qualitative vignettes of neighborhoods.

*EMS Shift Observations (QUAL-B)*

The second “core” strand of qualitative data consisted of the observation EMS shifts at Private Ambulance over a six month period between July 2013 and December 2013. I spent a total of twenty shifts, covering approximately 279 hours, as a “third rider” with Private’s
ambulance crews. Shifts were selected to cover a range of days of the week and times of day, including overnight shifts (see TABLE 3.5, p. 260). In most cases (fifteen of twenty shifts), the observation periods covered most but not all of the ambulance crew’s shift because Private Ambulance schedules many of its providers on “24s” - twenty-four hour shifts. I would, for example, arrive for a shift beginning at six in the morning and would stay until late in the evening (typically ten or eleven). The participating crew, however, would drop me off and continue on with their shift until six the next morning. For the two overnight shifts observed, I joined crews halfway through their shift and stayed with them until the end of their shift the next morning (see FIGURE 3.6, p. 261, for a summary of shifts and observation times).

Shifts were selected in consultation with Private Ambulance’s Director of Operations, who also assigned me to a crew working that shift. Crews were notified in advance that I was conducting research, and had the ability both in advance and at the beginning of the shift to opt out of the research though none declined to participate. Approximately half of Private Ambulance’s staff participated in the observation phase of the data collection, including the vast majority of the Paramedics regularly assigned to shifts in the City of Chapman. The final sample included twenty-eight providers, several of whom participated over the course of multiple shifts. These providers included seven Emergency Medical Technicians and twenty-one Paramedics. A total of nine women and nineteen men participated; women were oversampled purposely to increase the gender diversity of the sample. Data on participants is fully summarized in APPENDIX A. All providers were consented prior to the beginning of the observation period.

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8 A “third rider” refers to a person riding along with the two members of the ambulance crew. At Private Ambulance, these were often EMT or Paramedic students or physicians from nearby hospitals who were there to gain experience. As I noted above, providers were aware that I had worked as an EMT in the past, and occasionally asked for my assistance. This often amounted to carrying equipment or decontaminating the cot after calls (something I typically volunteered to do without being asked), but on several more serious calls providers asked for my direct assistance with helping move a patient or providing patient care. Balancing roles in ethnographic research is a common issue. The instances in which I did more than carry a bag or helped clean the cot were few and far between, and I do not believe these impacted the quality of the observation data.

9 Private Ambulance’s scheduling process is described more fully in CHAPTER 4 (see pp. 86-87).
Providers who participated in more than one observation shift were given the opportunity to opt out of further participation, though none chose to do so.

During shifts, brief notes were taken outlining each event. Then, during lengthy downtime periods and after the completion of the shift, I transcribed these notes into long form narratives of each event and entered the structured data (see APPENDIX C) into the data warehouse (see ‘Data Warehouse’, pp. 64-65). These field notes described the providers’ work during both emergency calls and downtime activities. Notes were organized in the following manner:

“emergency” notes began when the ambulance was dispatched to a call and covered the entire course of that call until its disposition. Disposition referred to the end result of the call, such as being cancelled and placed back in service by a dispatcher, not finding a patient, releasing the patient after treating them on-scene, or transporting the patient to a medical facility.

“Downtime” notes covered any non-call related activities. Downtime notes were divided based on ambulance movements with each note beginning with the crew driving the ambulance to their destination. The note would cover the crew’s activities at the destination. When the crew moved the ambulance to a new location, or was dispatched to a call, the note would end and new note would begin. A total of 478 notes were recorded during the twenty shifts, including 160 emergency call and 318 downtime notes.

The field notes included two types of data: unstructured notes describing providers’ actions during emergency calls or downtime activities, and structured variables of standardized data (see APPENDIX C for a complete list). Emergency note variables included data on response times and geographic data related to the starting location, scene location, disposition location, and driving routes. Other variables were also collected including data on the type of call found, the scene type, transport, and call disposition. These data were structured to match variables present in the National Emergency Medical Services Information System (NEMSIS) under the version two standard. Collecting data that matched NEMSIS was done to allow the eventual

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10 Some notes, such as the first note in a shift or a downtime note where the crew remained at the hospital after the ‘end’ of a call, are stationary notes. These cover the downtime activities only and do not include travel data since the ambulance did not move.
comparison of these ethnographic data with a broader dataset of Private Ambulance’s patient contacts. Downtime note variables comprised a more limited range of concepts related to the time spent on the activity and spatial data including the starting location, downtime location, and driving routes. During the analysis, these data were used primarily to support analyses of data for the first three research questions. They also were used to provide important context for the analysis of the fourth research question.

Spatial data for both emergency and downtime notes were collected using two iPhone applications. Point data, in the form of intersections and addresses relating to downtime activity locations was collected using the Google Maps web application. The same Google Maps application was used to collect Census geography in the field for call locations. Custom maps containing polygons representing each of the Census Block Groups were created before the beginning of the fieldwork. These maps were used to match the current location of the ambulance with the appropriate Census Block Group as the ambulance approached the scene. Tapping once on the appropriate polygon revealed the appropriate Census Block Group identification number, which was then recorded into the field notes (see FIGURE 3.7, p. 262). This process ensured that detailed spatial data about call locations did not need to be collected only to be de-identified later.

Travel route data were collected using the iPhone application myTracks (see FIGURE 3.8, p. 263). When running, this application collected waypoints for travel routes every five seconds. These routes were displayed on a map within the application and saved temporarily until the travel route data could be recorded in the field notes. Once transcribed, travel route data were permanently deleted from the phone. For routes involving emergency call scenes, data were transcribed only when the ambulance was outside the Census Block Group containing the call location.

EMS Interviews (QUAL-C)

The third “core” strand of data collected consisted of interviews with Private Ambulance
providers that were conducted in March and April 2014, approximately three months after I completed EMS shift observations. All twenty-eight participants in the EMS shift observations opted in to the EMS interview phase of data collection by indicating a willingness to participate in interviews on their consent forms. By the beginning of the interview phase, two of the twenty-eight providers were no longer employed at Private Ambulance, leaving twenty-six of the original providers. Four additional providers who had not participated in the observations were asked to participate in the interviews. I had met and spoken with all four of these providers during downtime periods of observation phase. The final interview sample of thirty providers included eight women and twenty-two men. Six Emergency Medical Technicians and twenty-four Paramedics participated in the interview phase. All providers, regardless of their observation participation status, were consented before the beginning of the interview.

On each of the seven interview days, Private Ambulance’s Director of Operations and I matched a list of potential participants with the roster of providers working. I then worked with Private Ambulance’s dispatchers to rotate ambulances out of the field so that interviews could be conducted. Interviews were conducted either in a private conference room or an office used by several of the supervisors, none of whom were present. Due to call volume, there were four interviews that were interrupted by dispatchers so that the provider’s ambulance could be returned to “the road” to respond to a call. Each of these four interviews was completed at a later time - three later the same day and one during a subsequent interview day.

All interviews, which lasted approximately an hour each, were audio recorded with the permission of the participants, and were professionally transcribed. The interviews were semi-structured, with topics selected based on an initial thematic analysis of the field notes from the EMS shift observation. Several emergent themes, including downtime during shifts, the use of personal technology, and five groups of patients (homeless patients, patients with mental illnesses, patients with substance use disorders, patients with “non-acute” illnesses, and patients with chronic illnesses) were identified for further exploration. The interview began with participants describing typical, good, and bad shifts. Providers were then asked about their
downtime activities, and to describe their views of Chapman City. The remaining time of the
interview was spent discussing providers’ views of each of the five groups of patients noted
above. The final interview guide is included in APPENDIX D.

Beginning approximately a third of the way into the interview, a sketch map was introduced
to participants (see FIGURE 3.3, p. 258). These sketch maps were used to collect spatial data
during the interviews. All participants were given the same introduction to the landmarks
labeled on the map, which included Chapman’s street grid, major bodies of water, and a number
of locations providers were known from the observations to be familiar with as part of their daily
work routines: Private Ambulance’s headquarters, both hospitals in Chapman, fire stations, the
police station, and major public transit hubs. Maps were printed in color and in large, 11” x 17”
format. Each map set included a participant map and an interview map. Spatial data were
solicited from the following prompts for areas where providers believed they (1) spent downtime
and (2) could not spend downtime. Additionally, data were collected for areas where providers
(3) responded “frequently” to calls as well as areas where they responded to calls for (4) patients
who were homeless, (5) substance use, (6) mental health issues, (7) “non-acute” issues, and (8)
chronic illnesses. Providers were also shown a map containing the frequency of calls for each
Census Block Group derived from the EMS shift observations. Providers were asked to comment
on this distribution, and areas that stood out to them as being surprising were noted.

Each area circled on the participant’s map, termed a “cluster” here (see FIGURE 3.9, p. 264),
was complemented with annotations on the interviewer’s map (see FIGURE 3.10, p. 265). After
the completion of the interviews, map data were digitized using a “touch” rule - if the circle
touched a Census Block group, it would be included in the digitized cluster (see FIGURE 3.11, p.
266). A count of the number of times a Census Block Group was included in a cluster for each
prompt was calculated. Clusters could also overlap, meaning that the total count for some
Census Block Groups exceeded the interview sample size (n=30).
Calls for Service Data (quan-a)

Supplemental data on the distribution of EMS work within the City of Chapman were derived from police data (see Disclaimer, p. 7). In Chapman, the Police Department routinely responded to EMS calls along with the Fire Department and Private Ambulance. Police “calls for service” therefore would represent a rough proxy for EMS demand. These data were incomplete, since not all of Private Ambulance’s calls were routed through the 9-1-1 system. Calls made directly to Private Ambulance included requests for both emergency and non-emergency transports from medical facilities; these “inter-facility transfer” calls did not include regular police responses. Another group of calls, those made where another police agency has jurisdiction such as the State Police, Transit Police, or a University Police Department, were also missing from this database. These limitations, and their implications for the overall analysis, are discussed further in CHAPTER 9 (see p. 221).

Given the focus of this study on EMS work that occurred in the community as opposed to transfer work, however the “calls for service” data provided an approximation for EMS demand in neighborhoods. The total Chapman Police Department calls for service database, from 2011 to 2013, contained 283,811 records. Of these, 30,939 records were identified as EMS-related incidents based on the presence of an Emergency Medical Dispatch code in the incident type (see APPENDIX E, pp. 376-379, for details on the EMD system and relevant incident types). These records were identified and aggregated to create frequencies for each Census Block Group representing estimated EMS demand for 2011, 2012, 2013, and a total of those three years. Additionally, a set of variables was added based on the EMD data present in the incident type.

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11 Emergency Medical Dispatch (EMD) refers to outcome of the Medical Priority Dispatch System (MPDS), which is the process that 9-1-1 operators use when receiving medical calls. The MPDS system guides operators through a series of questions designed to determine the severity of the medical complaint. The answers to these questions are used by computer software to generate an EMD code representing the type and severity of the incident. EMD codes are then communicated to EMS dispatchers and the codes are used by dispatchers to determine the appropriate type of EMS resource to direct to the call (see APPENDIX E, pp. 376-379 for additional details).
These were cross-walked with a table of EMD codes to add additional data about the cause and severity of each medical incident.

**Neighborhood Statistical Data (quan-b)**

Neighborhood statistical data were compiled from a number of sources (see APPENDIX E for a complete summary of these variables). The primary source was the 2008-2013 American Community Survey. Census Block Group estimates for a variety of demographic, social, and economic variables were manually downloaded from American Fact Finder. Additional neighborhood statistical data were compiled from a number of publicly available local and state databases that described the presence of various civil (e.g. public housing, transit station, fire station) and health (e.g. hospitals, clinics, homeless shelters, harm reduction programs) facilities. Finally, crime rates for each Census Block Group in Chapman were calculated using crime data provided by the Chapman Police Department.

**Spatial Data (gis)**

Publicly available spatial data describing the City of Chapman was obtained from the City’s Geographic Information Systems Office. These data included a variety of shapefiles compiled in a geo-database. Among the shapefiles contained in this database were the data used for creating the sketch map base maps: Chapman’s street grid (centerlines), TIGER/Line data for the city including the Census Block Group geography, water features, and the locations of a number of the social and health resources described in the previous section. These data were an important element of the data collection process, and were use extensively in the analysis of spatial data collected throughout the study as well (see the following “Data Analysis” section). These ‘gis’ data refer specifically to the existing geo-database that spatial data from other strands was ultimately linked to for analysis.

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12 Shapefiles are a file format for storing non-topographical spatial data. The file format originally developed by ERSI, the software developers of ArcGIS.
Data Warehousing

Mixed methods research has typically relied on research designs that analyze qualitative and quantitative data separately using traditional techniques (Bazeley 2010; Small 2011). For researchers interested in integrative analysis that use multiple techniques on the same body of data or merge data from different strands for analysis purposes, data management can become difficult (Bazeley 2010). This can be a particularly pronounced problem for studies leveraging spatial data (Matthews et al. 2005). There has been little discussion of solutions (Basely 2006), in part because of the relative small number of mixed methods studies that have pursued integrative analysis approaches (Small 2011). This study borrowed techniques from enterprise database design by using “data warehouses” and “data marts” for storage, manipulation, and analysis tasks (Nisbet, Elder, and Miner 2009; Silvers 2008). With the exception of the pre-built geo-database (the gis strand, see p. 63), all of the other data sources in the research design were imported into a central database known as the data warehouse (Silvers 2008).

Within the study’s data warehouse, data entry and de-identification for both structured and un-structured field notes was accomplished and, in many cases, automated. The data warehouse was also used for manipulating data from the supplemental quantitative sources. Using a relational database for these tasks was preferred over using a data analysis program like Stata or ArcGIS because databases are better suited for managing and aggregating data where one-to-many relationships exist. These analysis tools were used, however, as “data marts” (Silvers 2008), or specific ‘slices’ of data designated for specific analysis tasks. In this study, physical data marts (Nisbet, Elder, and Miner 2009) were used, meaning that data were exported from the data warehouse and stored externally for access by analysis tools. Slices of data from the warehouse, often combining qualitative, quantitative, and spatial data, were exported to each of these tools for subsequent analysis.

Data Analysis

The data analysis processes are described here using three shorthand terms that belie the
complexity of the data being analyzed: qualitative, quantitative, and spatial. These are done for ease of reference, and because they describe the primary focus of each analysis task. However, the reality is that slices of qualitative, quantitative, and spatial data were analyzed as part of all three major analyses.

**Qualitative Coding**

The “core” qualitative data analyses were accomplished using the software program Dedoose, which was selected because of its mixed methods oriented feature set. This analysis consisted primarily of the textual data collected during the EMS observations (QUAL-B) and the semi-structured interviews (QUAL-C). Field note and interview data were de-identified in the data warehouse and then uploaded to Dedoose’ servers. Two shifts worth of field notes were selected for initial inductive code development where emergent themes were identified (Charmaz 1983; Glaser 1978). An initial pass was made on these field notes to identify emergent themes, which were then subdivided into individual codes. After a draft code list was produced, these codes were applied to the same two shifts. As they were applied, the draft code list was refined. These codes were further refined by applying them to two additional shifts, and were then applied to the sixteen remaining shifts of field notes.

A similar process was followed with the interview transcripts. Two interviews were selected for an initial round of inductive coding where codes from the field notes were applied where possible. Themes that were not present in the field notes were identified from these two transcripts and additional codes were drafted from these themes. These new codes were applied to the two initial interviews, and then the entire code list was refined further using two additional interview transcripts. The codes were then applied to the remaining twenty-six interview transcripts. Once coding was complete, code reports were generated by Dedoose and reviewed for overarching themes present within the field notes and interview transcripts.

Beyond the generation of these inductive codes, a number of other strategies for coding and categorizing qualitative data. Mentions of particular neighborhoods were coded using a set of
deductive geographic codes - discussions of the “Midtown” neighborhood (and other neighborhoods) were therefore coded both for the themes present in the discussion and a code identifying the block of text as relating to “Midtown”. These codes relied on providers’ language choices for referring to particular neighborhoods and did no pre-suppose a particular spatial definition of the neighborhoods in-question. Similarly, particular sections of the semi-structured interview transcripts were coded using deductive codes that referred to specific sketch map prompts, allowing patterns within each prompt to be analyzed across respondents. This was done using a technique called code-by-code analysis in which codes were cross-tabulated so emergent themes that co-occurred frequently could be identified.

The codes for different of downtime activities were also converted into variables in the data warehouse so that each downtime event could be analyzed from both qualitative and spatial perspectives. If a code for one of the specific types of downtime activities was applied in Dedoose, the field note was also coded in the data warehouse using the corresponding binary variable for that activity. Each downtime field note was also associated with the closest street address in Chapman (n=59 individual addresses). This allowed for the tabulation and mapping of the locations where particular types of downtime took place. The resulting spatial output allowed for each type of downtime activity to be mapped and analyzed for spatial trends.

Quantitative Analyses

The “supplemental” quantitative data analyses used an analytic dataset where the Census Block Group was the unit of analysis (n≈90). This dataset combined data aggregated from the calls for service dataset (quan-a) as well as data from the neighborhood statistical dataset (quan-b), and the frequencies calculated for the interview sketch map exercise (QUAL-C) for the six emergency call related prompts (see pp. 59-61 above). Variables from the calls for service dataset included the total number of calls per Census Block Group, the number of calls broken down by severity, and the number of incidents for specific incident types. The incident types
were: (1) “1-37D” police incidents, (2) “Man Down” EMS incidents, (3) “Unwanted Person” police incidents, (4) “Unconscious” EMS incidents, (5) “Overdose” EMS incidents, and (6) “Psychiatric/Suicide” EMS incidents. Four of these incident types – “man down”, “unconscious”, “overdose”, and “psych” calls - correspond to Medical Priority Dispatch System protocols (MDPS; see APPENDIX E, pp. 376-379), while two others are police incident types that providers described responding to on a regular basis.

The data from the neighborhood statistical dataset included a count of the total population for each Census Block Group as well as four variables that measured demographic traits. These variables originated from the 2008-2013 five-year American Community Survey estimates for Chapman’s Census Block Groups. Two measures of race and two measures of socioeconomic status were used, including measures of the number of non-white and Hispanic or Latino residents. The two socioeconomic measures were the number of households whose incomes fell below the Federal poverty rates for their respective household size and the per-capital income for each Census Block Group.

Analyses of these data took on a number of forms, all of which used Stata 12. All correlations were calculated using Spearman’s rho given the non-normal nature of the key variables (see APPENDIX B for specific descriptive statistics and normality tests). Given the limited sample size of the analytical dataset, scales were used to summarize both the sketch map variables and the variables from the calls for service dataset (see Babyak 2004). The construction of both of

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13 The police incident type “1-37D” is a pseudonym. Both the Chapman Police Department and Private Ambulance use this label primarily to refer to patients with chronic alcohol use disorders who are also homeless. The label itself is derived from the State Public Health Laws that describe court mandated substance use treatment. Providers’ discursive practices related to this label are discussed in CHAPTER 7 (see pp. 154-155).

14 The police incident type “unwanted person” refers to request by business owners or other citizens to have an individual removed from their property.

15 Normality was assessed using descriptive statistics as well as Q-Q Plots. Hypothesis testing was also done to assess normality using Royston’s (1982) alteration to the Shapiro-Wilk (1965) test, which is valid for sample sizes where $4 \leq n \leq 2000$. The Shapiro-Wilk test is utilized because of its power relative to other theory driven normality tests (Razali and Wah 2011). Non-parametric measures of association decrease the likelihood of type I error (rejecting the null hypothesis when it is true) for data that do not approximate a Gaussian (normal) distribution.
these scales is discussed in greater detail in CHAPTER 7 (see p. 167 for the provider perceptions scale; see p. 171 for the calls for service scale). Cronbach’s \( \text{alpha} \) (Cronbach 1951), values were calculated for both scales. Cronbach’s \( \text{alpha} \) is a measure used to assess tests or a set of scores that can be used to assess the degree to which items are related to one another.\(^{16}\) This analytic dataset was also used in two sets regression analyses and their accompanying post-hoc tests – a logistic regression analysis predicting the odds of providers overestimating call volume (see CHAPTER 7, pp. 171-172) and an ordinary least squares analysis predicting providers’ focus on the “Midtown” neighborhood (see CHAPTER 8, pp. 182-183).

\textit{Spatial Analyses}

The “supplemental” spatial analyses were conducted using both ArcGIS and, for two specialized measures of spatial autocorrelation, GeoDa. These analyses include the spatial analysis of EMS observation field notes (QUAL-B), sketch map data (QUAL-C), and data from the quantitative analytic dataset. The input feature class for all analyses was the TIGER/Line data for Chapman’s Census Block Groups obtained from the geo-database described previously (see the ‘Spatial Data’ section above, p. 63). Initial analyses of data aggregated to the Census Block Group were done visually using choropleth maps that thematically mapped individual variables using a shading scheme where darker areas had higher values. All choropleth maps are presented in subsequent sections are renderings of the output produced by ArcGIS that transpose the color progressions onto the alternative cartography described in the ‘Human Subjects Concerns’ section under ‘Spatial Data’ below (see pp. 71-72).

\(^{16}\) The relationship between \( \text{alpha} \) and reliability is complex, and numerous critiques of the misuse of the statistic exists (see Cho and Kim 2015). Following Cho and Kim (2015), I interpret \( \text{alpha} \) as a measure of item interrelatedness.
Additional analyses using spatial statistics were also conducted using ArcGIS and GeoDa.\textsuperscript{17} These included several related tests of spatial autocorrelation, all of which were variants of the Moran’s \textit{I} statistic (see Getis and Ord 1992). Spatial autocorrelation represents the concept that like things tend to be near to each other geographically,\textsuperscript{18} and the Moran’s \textit{I} statistic captures the degree to which this is the case for specific distributions. Moran’s \textit{I} values, like correlation coefficients, range from -1 to 1 where -1 represents perfectly non-clustered data (think of the distribution of black and white squares on a chess board). A value of 0 for Moran’s \textit{I} represents data that are randomly distributed spatially, and a value of 1 represents highly clustered data.

In addition to the standard Moran’s \textit{I} (which was calculated using ArcGIS), two variants were calculated using GeoDa. The first was an Empirical Bayes Rate Moran’s \textit{I} (Anselin, Saybri, and Kho 2006; Clayton and Caldor 1987; Marshall 1991), which is specifically designed for identifying spatial autocorrelation in data that represent rates. Though the calculation for the test statistic differs significantly, this is interpreted in the same way as a traditional Moran’s \textit{I}. GeoDa was also used to create Bivariate Moran’s \textit{I} scatterplots, which can be used to visualize the spatial interdependence of two distributions. The data are overlaid on quadrants that identify areas of low-low, low-high, high-low, and high-high comparisons between an individual neighborhood (on the x-axis) and a lagged measure of its neighbors (on the y-axis). Statistical significance of statistic was calculated by GeoDa using a Monte Carlo simulation; for these analyses, a total of 9,999 permutations of the simulation were calculated to obtain pseudo \textit{p}-values.

Hot spot analyses of these data were calculated using the Getis-Ord \textit{Gi*} technique (see Getis and Ord 1992), which is ideally suited for aggregated data. The Getis-Ord \textit{Gi*} test calculates \textit{z}-

\textsuperscript{17} There is one significant difference between the statistics used in ArcGIS and GeoDa, which is the way spatial relationships were conceptualized for analyses in the two packages. In ArcGIS, a zone of indifference was used. GeoDa does not offer this option, and a Queen’s spatial weight was used instead. These approaches are both described further in Appendix E (see pp. 376-379).

\textsuperscript{18} This is often referred to as Tobler’s First Law of Geography, and is derived from a quote by Tobler - ”Everything is related to everything else, but near things are more related than distant things” (1970:236).
scores and p-values for each unit of analysis (in this case, each Census Block Group). Larger z-scores represent a greater degree of spatial clustering among high values in the data; the smallest z-scores represent a greater degree of spatial clustering among low values in the data. These data are useful for identifying areas where a given concept occurs or does not occur, and are used extensively to understand the degree of spatial clustering for certain types of calls or provider views about their work. Hotspots, which are appear in figures using shades of red, identify areas of higher than average values while cold spots, which appear in figures using shades of blue, identify areas of lower than average values.¹⁹

**Human Subjects Concerns**

*Patient Data*

Research on Emergency Medical Services, particularly research utilizing the collection of spatial data, raised important human subjects concerns. In this research, patients were not considered consenting research participants; only the EMS providers themselves were asked to consent prior to the beginning of their shifts or their interview. Though the research was focused on EMS work itself and not on patients' specific care or experiences, patients were told that I was a researcher learning about EMS work. If patients were uncomfortable with my presence or met certain criteria (such as being minors, being unresponsive, or being a prisoner), observations were discontinued and no field notes were recorded during their care. During the observation phase, there were no instances of patients requesting that I not be present for their care. A total of fourteen of the 160 (8.75%) observations of emergency calls were discontinued due to IRB exemptions: seven for patients who were minors, three for language barriers where the patient spoke little or no English and there was no bystander present to translate, two for

¹⁹ ArcGIS produces three levels of p-values at p < .1, p < .01, and p < .001. To simplify the presentation of data and to keep a standardized approach to hypothesis testing across the various different quantitative techniques utilized here, data significant only at the p < .1 level are not presented as statistically significant.
unconscious patients, one for a patient having a miscarriage, and one for a patient who was prisoner.

Data about emergency call work was also collected in specific ways to further protect patient confidentiality. Protected health information for patients (e.g. race, gender, and address) was not collected in field notes. Information about the patient’s chief complaint was collected as part of the structured field note process. This was particularly important for identifying “street level social work” during the analysis phase. These data, however, were collected in the most general manner possible using broad categories rather than verbatim statements. Finally, time and date identifiers were aggregated to protect patient privacy. These measures included using only weekday and weekend as date identifiers. Similarly, specific times were removed after response, on-scene, and transport times were calculated from both the field notes. This was done to limit the possibility of patients or providers being “reversed identified”.

Spatial Data

The innovative use of spatial data in a health care setting warranted special consideration. Spatial data were collected in ways designed to protect patient confidentiality. Call locations were geocoded in the field directly to Census Block Groups, thereby masking the data and ensuring that field notes never contained specific addresses for calls (see the following Data Sources section for more details on this process). Additionally, call location data were not necessarily synonymous with patients’ home addresses. During our 2009 pilot study, approximately 48% of calls observed were located at a patient’s residence. In this current study, approximately 30% of calls observed were similarly located at a patient’s residence.

Spatial data also raised concerns for dissemination. Qualitative GIS has relied not only on cartographic accuracy for data collection, but also for the dissemination of results. The publication of these data reveals much about an individual respondent’s life. For example, Boschmann and Cubbon (2014) published specific maps detailing a sample participant’s areas of residence, employment, and places they frequent for pleasure. This was not an outlier but rather
the standard in terms of presentation of data within the qualitative GIS literature. Given the small number of spatial data points required to identify individuals - as few as four latitude/longitude coordinates can identify individuals with 95% accuracy (de Montjoye et al. 2013) - caution should be exercised when spatial data are published about individuals. Matthews and colleagues (2005) chose to publish de-identified graphics that were devoid of spatial reference, which had clear drawbacks in terms of drawing larger inferences about the nature of their data.

For this study, human subjects concerns were such given the health nature of the data that the study site was not intended to be revealed. This raised a difficult dilemma - if cartographically accurate data are a core element of qualitative GIS, how could this be achieved without giving the research site away? As a solution, I employed the novel concept of alternative cartography. The goal with this approach was to faithfully represent spatial relationships while retaining a greater sense of space than the denuded graphics presented from other studies. Alternative cartography, as it was employed here, relied on the common spatial denominator described in the previous section on qualitative GIS. Each Census Block Group polygon was transformed from its distinct shape into (with a few exceptions) a quadrilateral shape that preserved the size and positioning of the Block Group relative to its neighbors (see FIGURE 3.12, p. 267). What resulted is an altered form of the City of Chapman that is faithful to the positioning of its Census Block Groups but obscures its actual shape (see FIGURE 3.13, p. 368). This allows for spatial data to be shared and interpreted without divulging the research site’s identity.

Data Synthesis
Since these data were analyzed in an “integrative” fashion (Small 2011), it does not make sense to present them in separate qualitative, quantitative, and spatial chapters. The following chapters represent the synthesized results of various qualitative, quantitative, and spatial analyses united by a shared theme. These results describe the degree to which space and place impact Emergency Medical Services work in a variety of ways over the course of EMS providers’
shifts - their downtime activities, where their emergency work occurs, and the ways in which their work clusters in specific neighborhoods with specific populations. Each of the following chapters is dedicated to these ideas in turn, and each contains a mix of data analyses that complement each other’s findings. Such a complementary nature is one of the strengths of mixed methods research (Small 2011), and presenting data in such a way draws connections between the data together in ways that provide greater clarity rather than artificial divisions. Each chapter begins with greater detail, where necessary, of the analysis techniques used in the data presented.
CHAPTER 4: Setting - The City of Chapman and Private Ambulance

This chapter focuses on the setting of this research project, the City of Chapman, and provides an introduction to the city and its neighborhoods, with data drawn from city historical documents as well as ethnographic observations of the neighborhoods themselves. These descriptions establish a common set of pseudonyms that will be used to identify particular neighborhoods. This chapter then describes the EMS system in Chapman as well as the operations of Private Ambulance, again drawing on ethnographic observations. The chapter ends with a discussion of how Private’s EMS providers view the city itself and its neighborhoods, using interview and sketch map data to better understand these general, subjective views of the City. These provider views lay a thematic groundwork for the remainder of the dissertation and identify areas of dissonance between how providers’ view Chapman’s neighborhoods and the “official geography” of the city. These provider definitions of neighborhoods are important for understanding the broader implications of space and place on EMS work as well as the ways in which EMS providers may impact neighborhoods themselves.

The City of Chapman

Chapman is a mid-sized city in the Eastern United States that is part of a larger metropolitan
Like many American cities along the Eastern seaboard, Chapman has followed a trajectory that began with 19th century urbanization and industrialization. The City, when it was incorporated during the mid-19th century, was an amalgamation of a number of smaller agricultural villages and a rapidly expanding industrial site known as East Chapman. The villages were originally separated by agricultural and marsh areas, which were filled in as dense housing and expanded industrial sites radiated outward from each of the original village sites. These neighborhoods had been filled first with Irish immigrants and, later in the 19th century, immigrants from Italy, Eastern Europe, and the Iberian peninsula. These same immigrant groups also found housing to the north, away from the original villages and towards a marsh filled area known as North Chapman. Here Irish immigrants labored in brick works, steel mills, and railroad yards that lined a stream known as Bullhead Brook. This area was the last area of the City to see large-scale growth, which occurred here during early to mid-20th century.

The industrial base for the city in East Chapman and other neighborhoods in the southern and central parts of the City eroded sharply during the depression and after World War Two. These were trends that mirrored larger demographic and economic shifts in the United States (Bluestone and Harrison 1982). Downtown Chapman in particular was the focus of post-war urban renewal projects that saw the demolition of some factories and the development of public housing complexes. Elsewhere, there was substantial mid-century development in North Chapman as suburbanization and the construction of highways provided new transit links into

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1 The following description of the City’s history is drawn primarily from a set of publicly available city planning documents. These documents are not cited because they would betray the actual identity of Chapman. The documents themselves are a set of neighborhood studies that the City has conducted on a rotating basis for the last twenty-five years. These studies are designed to guide the zoning and development planning processes for the neighborhood, and give a snapshot of the City’s and the neighborhood’s history. They also contain data on neighborhood-level demographic trends. For most neighborhoods in the City, these studies have been updated since they were first conducted; several neighborhoods where development has been most pronounced have had several updates to their neighborhood reports.
the City. The City’s neighborhoods continued to retain some of their ethnic character, though as the city’s economy changed so too did its demographic profile. In particular, City has transitioned away from manufacturing towards both the service industry and the “knowledge economy” (Powell and Snellman 2004) for the last three decades. This process of de-industrialization resulted in an overall population decline for the City of Chapman. Today, however, the city’s rebirth as a center of the “knowledge economy” has resulted in a population that has rebounded back over 100,000 residents.

Contemporary Chapman is racially and ethnically diverse, with a majority white population and large African American and Asian communities. These non-white communities are not segregated in “ghettoized” areas as they are in other cities (see FIGURE 4.1, p. 269), though much of West Chapman remains a largely white neighborhood of the city. Outside of West Chapman, the non-white population has a substantial presence in much of the rest of the city. West Chapman also has the highest cluster of per-capita income values, with much of the “Muir Hill” neighborhood (see next section) containing Census Block Groups with per-capita income values greater than a standard deviation above the mean. Block Group per capita income rates are below average for the city in much of Central and Downtown Chapman as well as North Chapman and the extreme end of West Chapman (see FIGURE 4.2, p. 270). Generally higher poverty rates, those above 7% of the Block Group population, are found in East Chapman, parts of Central Chapman, and North Chapman (see FIGURE 4.3, p. 271). With the exception of West Chapman, the City’s neighborhoods are not defined solely along racial and socioeconomic lines, though there are subtle patterns that emerge where East Chapman, Fulmore, and North Chapman have generally higher non-white and poorer populations.

*Chapman’s Neighborhoods*

The City of Chapman has a number of prominent features that will be important for orienting both the description of the City’s neighborhoods as well as the subsequent discussion of EMS work in the City (see FIGURE 4.4, p. 272). These descriptions rely primarily on the
neighborhood observations (see CHAPTER 3, p. 56) and are designed to provide a baseline of knowledge about the city’s neighborhoods that can be referenced in the subsequent substantive chapters of the dissertation. The most prominent feature in Chapman is “Main Street”, which extends from Chapman’s southern boundary all the way to the City’s northern edge. Along the City’s western and southern boundaries is “Fulmore Parkway”, which is a state maintained highway built in the early 20th century. At its western terminus, Fulmore Parkway connects into another state parkway that crosses into North Chapman and connects to the State’s interstate highway system. This parkway, “Bullhead Parkway”, runs along a large lake in North Chapman known as “Bullhead Lake”, which is a prominent element of the city’s physical geography. The City’s other major thoroughfare is “Chapman Street”, which connects the Old Quarter and East Chapman and, along with Main Street, serves as a major cultural and economic nexus for the city.

Northern Neighborhoods

Chapman’s north side has three neighborhoods: “North Lake”, “North Chapman”, and “Uptown”. North Chapman is hemmed in by the city’s northern and eastern boundaries on two sides and railroad tracks on a third. The eastern half of the neighborhood is primarily residential. The central feature of this residential portion, visible from quite a distance, is a trio of large brick apartment blocks that evoke images of high-rise public housing in larger cities like New York or Chicago. The “Rodgers Towers” are not publicly operated housing; they are a privately operated, affordable housing complex built with federal Housing and Urban Development funds. Next-door to the towers is a lower density affordable housing complex of newer vintage and then a sprawling low-rise complex that is operated by the Chapman Housing Authority (CHA). There are several other high-rise complexes in North Chapman that are also operated by the CHA and cater to individuals who qualify for social security retirement or disability payments. Outside of these complexes, much of the neighborhood’s housing stock consists of two and three story wood frame homes in densely built neighborhoods. The western
half of the neighborhood, across Bullhead Parkway from the Rodgers Towers, consists of two large mixed-use tracts. These are both newer developments that consist of housing units as well as commercial properties that include laboratory spaces and other knowledge-work employers. A large transit hub that connects suburban commuters to the larger metro public transit system anchors these tracts. The transit hub itself includes several restaurants, and a railroad maintenance facility adjacent to the site.

The neighborhood of North Lake is located to the west of this railroad maintenance facility and the associated rail yard. The neighborhood boundaries are defined by parkland that abuts Bullhead Lake on the west side of the neighborhood and the rail yard on the east side. The southern boundary of the neighborhood, straddling Bullhead Parkway, has two large shopping centers with grocery stores and other retail establishments as well as newer condo and apartment complexes. The core of the neighborhood is a large industrial and warehouse complex that occupies much of the center of the neighborhood. This area includes Private Ambulance’s headquarters, a number of different small manufacturers and businesses, and several technology companies. At the very northern edge to the city, beyond this industrial area, is a small residential community consisting primarily of single-family dwellings.

The final neighborhood on Chapman’s north side, “Uptown”, is a residential neighborhood to the south of both North Lake and North Chapman. The neighborhood contains a large city park, surrounded by higher density private apartment complexes, several of which are mixed or low-income properties. The neighborhood contains three distinct residential zones. One zone, south and west of the park, consists primarily of two and three story multifamily homes. The second zone, south and east of the park, consists primarily of single-family residences on larger lots. The final zone, south of the others, has a large number of densely set apartment buildings. These buildings line Main Street in this area as it moves south from North Chapman towards the “Old Quarter”. This stretch of Main Street consists of mixed use buildings as well as some single story commercial strips with business, restaurants, and shops. Where Main Street crosses from
North Chapman into Uptown is an area known as “Uptown Plaza” - a commercial area with a shopping center, several restaurants, and a transit hub.

Western Neighborhoods

West Chapman is defined by two neighborhoods - “South Lake” and “Muir Hill” (see INSET 2). “South Lake”, across the pond from North Chapman, is in some respects more similar to North Chapman than West Chapman. It is defined, as North Chapman is, by a large high-rise originally built as low-income housing. However, unlike the Rodgers Towers, this has recently been converted into condominiums. The neighborhood also contains a low rise public housing complex and a number of small neighborhoods of primarily three story wood frame homes. Several streets in South Lake showcase the neighborhoods’ Italian heritage, featuring red, white, and green painted lane lines in the street and curbstones. Muir Hill, located below South Lake and west of Uptown, is almost entirely residential as well. The area where Muir Hill and Uptown abut each other, known colloquially as “the Village”, has a mix of multifamily dwellings and some small apartment buildings. The same is true where Muir Hill and the Old Quarter abut each other. Much of the rest of the neighborhood is comprised of large single-family homes on spacious lots. The neighborhood also contains one of two medical centers within Chapman that Private Ambulance regularly transports to - the “Muir Hill Hospital”. Where the Muir Hill and Goodman Hill neighborhoods come together is known as the “Old Quarter”.

The Old Quarter

The Old Quarter consists of a trio of neighborhoods - “Palmer”, “Goodman Hill”, and “Lower Goodman”. Palmer extends from North Chapman and the Uptown Plaza area south to Old Town. Near Uptown, the neighborhood is primarily multifamily dwellings with retail and dining establishments along Main Street, which serves as the neighborhood’s western boarder. The center of the neighborhood is largely university buildings for several of the universities that are
based in Chapman. To the east of this area is a lower density neighborhood consisting primarily of single-family homes. Goodman Hill is also defined by the presence of university buildings, but also by densely packed private housing. The private housing stock in this neighborhood consists both of large apartment buildings and multifamily dwellings. The Goodman Hill neighborhood also contains Chapman’s major safety net medical center, the “Mather Hospital”, which is located on Chapman Street. Where the Goodman Hill and Muir Hill neighborhoods there are two major intersections with public plazas - University Plaza and Eaton Plaza. University Plaza is dominated by buildings dedicated to higher education as well as some retail establishments, whereas Eaton Plaza is primarily a commercial area with retail stores and offices. Both of these areas are significantly more built up than the surrounding neighborhoods. Finally, the Lower Goodman neighborhood serves as continuation of the Goodman Hill neighborhood, containing university housing and then tightly packed multifamily dwellings along with a low-rise public housing complex known as “Goodman Terrace”. Main Street continues to serve as a major boundary here, dividing the Goodman Hill and Lower Goodman neighborhoods. In this area, Main Street is lined with high-rise housing and a mix of commercial properties including offices and some eating and drinking establishments.

Central Neighborhoods

South of the Old Quarter neighborhoods in Chapman are a band of neighborhoods known as the Central Neighborhoods - “Oxford”, “Mid-Chapman”, and the “Fulmore”. The “Oxford” area of Chapman, through which Chapman Street runs on its way from the Old Quarter south to East Chapman, is located near the Mather Hospital. At its heart is “Tory Plaza”, which is filled with restaurants and bars as well as apartment buildings. Tory Plaza is less densely built than the other plazas in Chapman and lacks a major public transit hub. Oxford’s commercial district runs the length of Chapman Street with bars and retail establishments. Off Chapman Street, the neighborhood consists of multifamily homes and apartment buildings. The neighborhood
contains a large city park as well as a low-income facility known as the “Tory Homes” that consist of a number of low rise buildings surrounding a high-rise apartment block.

The “Mid-Chapman” neighborhood consists of a major commercial strip along Main Street with bars, restaurants, and retail establishments. Further south on Main Street, this gives way to large mixed use commercial spaces where a significant amount of redevelopment has occurred. This area is among those industrial parts of Chapman that has seen widespread deindustrialization and then a resurgence of knowledge work type jobs. Though there is some active manufacturing that still occurs here, many of the old factories have been torn down and replaced with new construction to house information technology enterprises. The area also contains two large low-rise public housing complexes - the “Washington Homes” and the “Jefferson Homes”. These lie between the more residential side of the neighborhood and the former industrial zone that has seen redevelopment.

The third and final neighborhood in Central Chapman, the “Fulmore”, lies on the other side of Main Street from Mid-Chapman. Like Mid-Chapman, the Fulmore is defined by its commercial trail along Main Street that includes bars, restaurants, and retail on the ground floor of buildings that have either offices or apartments on the upper floors. The Fulmore also contains a number of high rise public housing complexes for social security eligible tenants and, again like Mid-Chapman, has seen widespread redevelopment on its south side. Here, as in other neighborhoods, former industrial sites now house information technology and other “knowledge work” companies. The neighborhood is a mix of multifamily homes and apartment buildings, and contains high rise apartment buildings as well as several strip malls on its west side along the Fulmore Parkway.

**Downtown Neighborhoods**

The final set of two neighborhoods lie south of a railroad line that cuts across the full width of the city on its southern end. Below these tracks are “Downtown Chapman” and “East Chapman”. Downtown Chapman encompasses a large swath of former industrial sites that have
been repurposed by “knowledge work” firms, and university facilities. On its east end is “Downtown Plaza”, a heavily built up area consisting of largely new construction focused on Chapman’s knowledge economy as well as condominium and apartment buildings. This area has seen development in the last decade as the city has rebounded from deindustrialization, To the east of Downtown plaza is “East Chapman” - one of the original population centers of Chapman. The oldest areas, where some of the original industrial revolution-era manufacturing sites were located, have been redeveloped primarily as shopping and retail areas along with hotels and apartment buildings. The rest of the neighborhood has retained its roots as one of the original residential centers of the city, with densely packed multiple family homes. These homes lie to the east and west of Chapman Street, which is the major commercial center for the neighborhood with restaurants, shops, and bars for much of its length through the neighborhood. There is also another high-rise operated by the Chapman Housing Authority in this neighborhood. The neighborhood also has a district known simply as “the Point” that has seen recent large-scale development of high-rise apartments and condos.

EMS in Chapman

Three agencies, public and private, provide first responder services to the city of Chapman. The Chapman Police and Fire Departments are both publicly operated first responder organizations. The Fire Department, in addition to providing fire suppression services, also operates the City’s Emergency Medical Services system in partnership with a private ambulance company. “Private Ambulance,” as I call it here, is contracted by the City to provide medical transport services from emergency scenes to local hospitals. Private Ambulance receives emergency calls through the City’s 9-1-1 center, which is colloquially known as “fire alarm”.

The 9-1-1 process deserves further explanation because it is the source of the call data presented in subsequent chapters. Once a call is placed to the 9-1-1 center, a call-taker records information about the call and, for most medical calls, proceeds through the Medical Priority Dispatch System (MDPS; see Appendix F, pp. 376-379 for additional details). This is a guided
set of questions that help the call taker determine the appropriate type and amount of medical resources to send. The end result of the MDPS is the creation of a determinant code that describes, roughly, the type of medical emergency that the caller is reporting. Based on this code, resources from the Chapman Fire Department, Police Department, and Private Ambulance are dispatched. For higher priority codes, known as “Charlie”, “Delta”, or “Echo” codes, Advanced Life Support resources (which consist of one of the engine companies, “the rescue”, and two smaller vehicles known as “the squads”) from the Fire Department may be sent along with the closest fire apparatus and an ambulance. For lower priority codes, known as “Alpha” and “Bravo” codes, only an ambulance is dispatched along with, for some calls, the closest fire apparatus.

Importantly, this response system is only the primary system for EMS response in Chapman. Private Ambulance also responds to calls made directly to them for various health care facilities that it has operating agreements with. These calls are dispatched to ambulance as if they were emergency calls, but Private Ambulance’s crews do not have to keep the City’s 9-1-1 center notified of their progress. There are also other health care facilities within the city that have their own contracts with EMS services, particularly several nursing and rehabilitation facilities. Finally, Private Ambulance provides interfacility transfer services for both of the city’s medical centers - the “Muir” Hospital located in West Chapman and the “Mather” Hospital located on the city’s eastern edge. Of the two, the “Mather” is the city’s safety net hospital that is operated under a public-private partnership between Chapman and a private health care system.

Private Ambulance

In Chapman, as in many cities, the ambulance services are provided not by the Fire Department or a “third service” municipal agency but rather a private company. However, 

2 As a safety net hospital, the “Mather” makes care for underserved and vulnerable populations a cornerstone of its service. Definitions of safety net hospitals vary, but they are typically defined by their focus on patients who do not have insurance, have Medicaid, or otherwise are “low income”. Additionally, safety net hospitals focus their attention on patients who have substance use disorders or mental illnesses, who are HIV positive, or who are homeless (IOM 2000).
unlike in many cities where that private entity is part of a larger, for-profit national EMS company, “Private Ambulance” is a small, local company that has two primary service areas. The City of Chapman is its original service area, and the bulk of its ambulance units are assigned there. The following description of Private Ambulance’s operations is drawn from a synthesis of the field notes collected during the six months spent “riding third” with Private Ambulance’s crews (see CHAPTER 3, pp. 56-59).

Private Ambulance operates out of a warehouse-like building located at the extreme northern edge of the city in an industrial park. The lower level of the building houses a classroom for the company’s Paramedic courses that it offers every year. The upper level contains additional spaces for training, a small medical library, conference rooms, and offices for the operations staff and the providers who also work as instructors for the Paramedic program. There are also two bunk rooms and a third room referred to as the “crew room” that sit to the back of the upper floor, near the stairs down to the large garage at the back of the building.

Additionally, there is a small, windowless office located in the heart of the upper floor that serves as the dispatch center for Private Ambulance. There are typically two dispatchers working during weekdays, and one dispatcher during overnights and weekends. The dispatch office is a hub of activity - the dispatchers answer incoming phone calls for business related to the company as well as requests for ambulance responses from their various contracts that are not routed through the 9-1-1 system. Computer screens and a large bank of flat screen TVs display information about the availability and location of each of Private’s ambulances (each ambulance is tracked using a GPS unit located in the cab of the ambulance). The TVs also display historical call data so that dispatchers can identify areas of the city that, for that particular time of day, may be “hot spots” for calls. The dispatchers receive incoming calls from the 9-1-1 system through a Computer Automated Dispatch (CAD) system whose interface and courier font type evoke the early 1990s Microsoft DOS operating system (or, for statistically minded readers, Stata or SAS’s utilitarian user interface). Calls pop-up on the CAD terminals as they are
dispatched by the 9-1-1 center, and then Private Ambulance’s dispatchers send the closest appropriate ambulance. The exchange typically goes like this:

  Dispatcher: P6...

  P6: 6...

  Dispatcher: P6, respond to 123 Main Street for the man down. Call comes in through fire alarm.

  P6: 6 is responding.

Ambulances are each designated with a call sign. In the above example, “P6” refers to both the level of care the ambulance can provide (Paramedic or “P”) and the ambulance’s individual number (“6”). Ambulances with paramedics (“medics”) always are staffed with one and often two paramedics. When they are staffed with only one medic, they are known at Private Ambulance as “PB” trucks, a designation which refers to both the paramedic (“P”) and the EMT or “Basic” (“B”) working onboard. Ambulances with only EMTs use similar call signs, except they replace the “P” designation in the above example with an “A”. Thus, “P6” is paramedic ambulance 6 while “A1” refers to EMT ambulance 1.

The medic trucks, whether they are staffed with either one or two medics, are box-like ambulances that are known within EMS as Type I or Type III ambulances (these types are differentiated based on their chassis). These ambulances have more storage room for equipment and additional room in the patient compartment, both of which being important considerations for paramedics who carry more patient care equipment and often have students or other staff with them in the back of the ambulance as they deliver patient care. The ambulances designated for the EMTs are smaller Type II ambulances, which use a smaller van style chassis. These have less room for both storage and patient care, and are slightly less comfortable to spend shifts in because of their smaller size.

When providers arrive for their shifts, they visit the dispatch office and are assigned an ambulance. On one wall of the dispatch center, portable radios sit in chargers with two radios assigned to each ambulance. Providers will grab the pair of radios that correspond to their assigned ambulance and then walk downstairs to the cavernous, two-story high garage at the
providers will find their assigned ambulance, ensure that it is in working order, sign onto the tablet computer that they use to complete patient care reports, and quickly check their medical equipment to make sure their supplies are in order before heading out on the road. There is often a push to get ambulances out “on the road” as soon as possible so that they are available for calls and in a position to respond quickly. Occasionally, however, at the beginning of shifts providers will be asked to run errands for the dispatchers, including taking the ambulances around the corner to a maintenance facility that provides service to Private Ambulance and other first responders in the Chapman area. Since Private’s ambulances are on the road almost every day, they require frequent maintenance to keep them running. Once any required errands are done, providers will notify their dispatcher that they are “on the air” (monitoring the appropriate radio frequency) and available for calls as they pull out of the garage.

For providers, being on the road means spending nearly their entire shift in their ambulances. Crews are occasionally asked to return to base (Dispatcher: “P6, can you 60?” - with “60” being the radio code for returning to the headquarters). However, this is not the norm for most trucks on most shifts. Shifts for providers vary based on the type of truck they are assigned to. Medics often work twenty-four hour shifts (“24s”) that begin at either 0600 hours or 0700 hours (communication within EMS and the first responder world more generally occurs using a 24 hour clock). There are three ambulances that are staffed each day for twenty-four hours, and these are all typically staffed with at least one medic. Additionally, some medics work shorter shifts, typically twelve-hour shifts (“12s”) that begin in the morning and end in the late evening. EMTs who are working on a BLS ambulance for the day begin their shifts, which are
between eight and twelve hours long, over the course of the morning with start times staggered between 0800 hours and 1200 hours (noon). There are four BLS ambulances that are routinely staffed each day. There is also an extra BLS shift that is only staffed on Fridays and Saturdays from 1400 hours until 0200 hours the next day.

The three medic trucks that work for twenty-four hours are split into two groups: a single “base” truck and two “city” trucks. The base truck returns Private Ambulance sometime between 2300 hours and 0200 hours depending on call volume and whether or not it is a weekend - the weekend trucks remain on the road until 0200 hours or later. The providers assigned to this truck spend the night sleeping in one of two bunk rooms or on one of the two large couches in the “crew room”, which also contains TV trays for eating meals and a TV. Providers who are not working an overnight but only have a few hours between shifts also sleep in this area of the headquarters. The “city” trucks do not return to the headquarters to sleep, spending the night instead in a bunkroom at the Mather Hospital. This bunkroom contains two bunk beds with futons set up underneath, several TV trays, and a television. Crews are actively discouraged from using the crew room at the Mather during the day - dispatchers will monitor their location and ask providers to “centralize” or post in particular parts of the city if they notice an ambulance lingering at the Mather hospital during the day. The exception to this is Sundays, when the atmosphere is more laid back and providers will often spend the day lounging at the Mather, watching “Law and Order” marathons or TV movies.

**Providers’ Views of Chapman**

Since providers spend much of their shifts “on the road” and not sitting in a fixed location such as a fire station or the Mather hospital’s crew room, it is unsurprising that they have a good deal of knowledge (and thus opinions) about the City of Chapman. Providers’ beliefs and perceptions about the City, particularly regarding the socioeconomic diversity to the city, provide a useful foundation for understanding how they view their patients and the neighborhoods that they provide EMS services to. These perceptions about the City were
obtained from the semi-structured interview (see CHAPTER 3, pp. 59-61), which included several questions about what providers think about the City, where they spend off-duty time in the City, and how familiar they were with the City before they began working at Private Ambulance.

During the interviews, providers expressed either mixed or largely positive impression of the city during the semi-structured interviews. Only two providers gave generally negative impressions (see TABLE 4.5, p. 273). Many providers pointed to the city’s aforementioned social and economic diversity as well as the city’s reliance on the knowledge economy as defining features of the city itself: “It’s kind of like a... a... I don't really know. Liberal. Multicultural and academic type... It is what it is. And yeah. That’s really it. It's [a] nerdy melting pot.” They also pointed in particular to the wide range of socioeconomic statuses present within the city itself:

CP: ...what do you think of the city as a whole?

Preston: Uhhh it's a unique place. It's diverse. Lot of different things?...We have some pretty substantial affluence mixed with some legitimate poverty...and everything in between. Umm very liberal city, very...you know now I wouldn't say hippy but it's a... it's certainly not the conservative place to be. But it's interesting. You meet a very wide ranging group of people.

Providers routinely discussed “diversity”, as Preston did, in terms of the socioeconomic variation of the City and specifically in terms of particular neighborhoods as “poorer” or “wealthier”. One provider noted that the city Chapman is “diverse...could be, you can be in low income housing one call, you could be in a shelter another call, or you could be in a mansion at another call up off of [Muir] Street [in the wealthier area of West Chapman]... so it’s diverse.” The socioeconomic diversity these providers identified presented both an interesting and sometimes challenging work environment.

Providers identified socioeconomic diversity as a particular challenge because it had consequences for the types of calls they were exposed to on their shifts as well as their interactions with bystanders and other members of the public. One downside providers expressed was a perceived entitlement or privilege among upper class residents of the city:

Pam: And I think a lot of people like to hear themselves talk in [Chapman]... I think there’s a lot of privileged people in [Chapman] and that’s good and bad... lately with
people being so nasty about where we’re parking and everything [it] is definitely annoying. [And] there’s a lot of physicians in [Chapman]. And they’re not trained in anything emergency. So it’s like they’re like ‘give them Haldol’. And it’s like I don’t have Haldol. Get away from me, you know what I mean?

CP: So these are physicians not that are part of the call necessarily?

Pam: No. They’re like they’re bystanders or they’re callers. And they mean well. I know they mean well, but it’s definitely annoying. And you have to kind of be like, okay, thank you, sir, like we have this. Like I do this every day and a hundred times a day.

Chapman’s wealthier residents were described by providers in largely disparaging terms. In particular, the providers singled them out as a group individuals who often did not understand the role of EMS provide, who interfered with patient care (despite their good intentions), or who were confused about why ambulances are parking in certain parts of the city. This privilege, some providers believed, also meant that there were class differences in who accessed the EMS system:

Jeffrey: …There’s a lot of different, broad spectrum of patients... Students, because of [the] schools here. A lot of homeless people. Good amount of drugs, is all mixed in, some violence, a lot of rich people, too. But most of the time, you don’t really see the rich people until they get really sick...because they can actually, know what they need to do. They have the right healthcare. They can go see a doctor and get it treated. But usually when you’re finding the upper class people, they’re really sick and they need an ambulance.

Another provider concurred, stating that in Chapman “you have the lowest of the lows and you have the highest of the highs. Like you’ll have your [wet shelter] population, then you have your [Muir Street] population, which is like gorgeous, these million dollar homes. So the spread of wealth in the city is huge.” This association with class and EMS system in important because of many of the providers focused their attention during the interviews, as Jeffrey did, on patients who lived in public housing or who were homeless.

For many providers, these opinions are formed on the job. Only a quarter of the providers interviewed reported being very familiar with the City of Chapman before they began working for Private Ambulance, and more than two-thirds of providers had never lived in the city (see TABLE 4.6, p. 274). For many providers, the deeper knowledge they gained through this work was the root of their mixed views about the city as a whole:
Ben: It's a... I used to think it was a lot bigger of a place when I would come here to visit, the city was overwhelming, like ‘Oh my god, I’m in the city’, getting on and off the [Regional Transit] like it was kind of overwhelming. I really felt like I was in the city. Now knowing it as well as I do, it just feels like a town. It doesn’t feel big anymore. It's not intimidating anymore... So in that sense I guess it's a positive and negative. I've learned a lot about the city, but a lot of the luster is gone. You see it for kind of what it is. The groups of people in certain areas and it’s just it’s not as magical as what it was when you visit it as an outsider. And now I feel like I’m on the inside.

Seeing the city ‘or what is’ meant for this provider and others that they were exposed on a daily basis to the social problems endemic in Chapman and other cities, including substance use, violence, and poverty. It also meant the daily exposure to wealth and privilege that far exceeded the providers’ own circumstances.

**Providers' Views of Chapman's Neighborhoods**

Providers also mentioned the diversity of the City of Chapman both in the context of the different populations they were exposed to but also in terms of specific neighborhoods. In the previous section, a number of quotes identified West Chapman as a particularly wealthy neighborhood. During both the EMS shift observations (see CHAPTER 3, pp. 56-59) and the semi-structured interviews (see CHAPTER 3, pp. 59-61), providers expressed numerous sentiments about different neighborhoods as well as the types of people and patients they found there:

**Shift 596, Note 10**

I asked Tim about seeing the [homeless] patient before. He said that he saw him a few weeks ago for the same reason, but thought that he hadn't been "on the scene" very long. He noted that they didn't go to those types of patients very often in [Uptown]. He also noted that they see many of those patients in East [Chapman] and [Midtown], which are the most "inner city"; West [Chapman] is where the "money" is.

In specifically spatializing the descriptions of their work, providers attached meaning to different neighborhoods as well as definitions of these neighborhoods themselves. Though providers were not asked specifically about their perceptions of neighborhood boundaries, it is possible to discern much of the way in which they perceive neighborhood boundaries through the semi-structured interview’s sketch mapping and transcript data.
The question of how neighborhoods are defined has been an overarching methodological concern within the neighborhood effects literature (see CHAPTER 2, pp. 29-31). Neighborhood definitions have had particular salience for researchers because much of the neighborhood effects literature has relied on externally defined “neighborhoods”, often using zip codes or Census geographies such as the Census Tract, as proxies for neighborhoods. Yet there is widespread belief (Galster 2012; Messer 2007) that these proxies are rough estimations at best and increasing evidence (Coulton 2012; Coulton et al. 2001) that neighborhood boundaries identified by individuals are flexible, fuzzy constructs. Much of this literature has focused on residents’ perceptions of neighborhoods rather than other groups, such as the perceptions of service providers who work in these areas. If these service providers serve as the mediators between place and individual outcomes, their own perceptions of space matter substantially as well.

The neighborhood descriptors that providers used during the semi-structured interviews differed from the neighborhoods described earlier in this chapter. In particular, providers relied less on the formal name of neighborhoods and more on colloquial definitions of neighborhood that emphasized the plazas in the City as neighborhoods themselves. This differs from the official geography of the city that excludes these from neighborhood definitions. Providers also used a wider definition for neighborhoods, sometimes lumping two or more official neighborhoods together. This can be seen in the sketch map data, where providers were asked to identify the names of the clusters they drew. As FIGURE 4.7 (see p. 275) shows, providers used a similar number neighborhood definitions as the official geography. However, these definitions differed in terms of their scope. Providers would collapse some neighborhoods together while splitting other neighborhoods up into alternate configurations.

Much of this tension between official neighborhoods and inform spatial definitions is driven by a series of focal points, all of which are transit hubs and have public plazas surrounded by businesses and mixed use buildings. These “plazas” are not part of the city’s official geography, yet they are major landmarks that have substantial meaning to residents and others who
frequent the city. Both the official neighborhood geography as well as some of the colloquial
definitions of neighborhood will be utilized in both this and subsequent chapters.

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This chapter serves as a formal introduction to both the city and the ambulance company
that serve as research sites, and also as an introduction to important themes that will appear
repeatedly throughout the next four chapters. Providers’ perceptions (and misconceptions)
about where they respond to calls on a regular basis is one focus of CHAPTER 5. Questions of
class and privilege are returned in CHAPTER 6, which explores the ways in which these tensions
shape providers’ downtime through the creation of “off limits” areas of the city. The
spatialization of the social problems that providers discussed when describing the city as a
whole is the chief focus of CHAPTER 7, which addresses the distribution of emergency medical
services work, particularly as it relates to illnesses that providers believe should not be the main
focus of their jobs. CHAPTER 8 explores the impact of these issues on one particular
neighborhood where homelessness is a major concern by focusing in part on the shelter system
that was repeatedly discussed as providers described the city itself.
A fundamental assumption behind the four aims for this study (see CHAPTER 1, pp. 18-19) is that place matters for Emergency Medical Services work. Such a focus on context is part of a broader intellectual interest in the impact of place that has emerged in both the social and health sciences over the last two decades, epitomized by Robert Sampson’s *Great American City* (2012) and Ichiro Kawachi and Lisa Berkman’s *Neighborhoods and Health* (2003). Both of these texts represent a large and robust literature on how neighborhoods affect a diverse range of individual outcomes such as mortality, exposure to violence, social capital, poverty, and racial diversity (see CHAPTER 2, pp. 28-29). As I have previously noted, this literature has focused overwhelmingly on how neighborhoods matter for residents, how to properly define these neighborhoods, and whether this residential composition can be separated from contextual effects of place.

Looking at place through the lens of Emergency Medical Services offers an opportunity to refocus the intellectual debate about place on mechanisms - in this case on a pathway through which place may impact individual health outcomes. Providers’ recognition of and responses to spatially clustered social problems, like poverty, or clinical populations, like the homeless, are important in their own right. However, these perceptions are more important if they are a
vehicle for how place can get “under the skin” (Hertzman and Boyce 2010) if, for example, a patient’s physical location becomes a means for explaining away or downplaying the severity of their illness. Beyond the effect of place on patient care, a focus on Emergency Medical Services also provides us an opportunity to understand how neighborhoods matter for work and employees. For EMS providers, patient care represents only part of their shift. A focus on the sociospatial context of their work defined more broadly brings to the fore the ways in which neighborhoods impact the availability of amenities for workers, the way “extralocal institutions” (Sampson 2012), of which I argue EMS is an example, use and shape space in a variety of ways, and the conflicts such use can foster (these topics are discussed throughout the next several chapters).

This chapter presents an empirical analysis of the spatial distribution of EMS work with a particular focus on (a) how this work clusters in certain areas of Chapman and (b) how providers’ perceptions of this work differ from objective measures of their work. Discrepancies in providers’ perceptions, especially if they are associated with particular social or clinical populations, provide a means for identifying particular areas of the city that have an outsized social psychological effect on providers. These outsized areas are described as analogous to the “clinicians illusions” (Cohen and Cohen 1984) that health care providers have about their patients. These illusions are fundamental misinterpretations that providers make because of the selection bias inherent in their clinical practices. Focusing on this misattribution gives us a window into providers’ impressions not just about where their work occurs but of the social and clinical populations that demand particular attention. This reframes our attention from asking if space matters to asking, in later chapters, for whom space matters more or less for in the context of emergency medicine.

The Substantive Logic of EMS Work

This chapter and the subsequent chapters in this dissertation make an analytical distinction between two overall categories of Emergency Medical Services work: emergency calls and
downtime. Emergency calls are responses to requests for medical assistance. Emergency calls, or simply “calls” or “jobs” to providers, are the central focus of their workday. Since they are unscheduled in the sense that providers do not know from one minute to the next if they will be sent to a call, there are periods between calls when providers wait for dispatch to their next call. These periods are termed downtime here, and can encompass a variety of activities including paperwork, searching for meals, using the bathroom, driving to a location to provide “coverage” for a neighborhood of the city, or sleeping. In structuring the field notes collected during the EMS shift observations (see CHAPTER 3, pp. 56-59) distinctions were made between discrete instances (or “events”) of both types of phenomena. The shift observation notes therefore can be broken down into emergency call and downtime events (see TABLE 5.1, p. 276). One important point to note is that downtime does not meet exclusively personal time for providers - many downtime events, for example, involve paperwork or running work related errands as requested by Private Ambulance’s dispatchers. Both phenomena are therefore integral to the overall experience of a shift for providers.

In assessing the degree to which EMS work is spatially clustered or randomly distributed throughout Chapman, a distinction is made between these two types of phenomena. The distribution of emergency calls is viewed both through an objective lens, using calls for service data, as well as a subjective lens that relies on providers’ own perceptions of their work. This chapter then assesses the relationship between the distribution of emergency calls and provider perceptions of this distribution before examining the spatial patterning of downtime throughout the City. The data presented here draw an overall spatial picture of EMS work in Chapman that is then explored in greater depth in subsequent chapters. In focusing on the spatial logic of EMS work, emergency calls and downtime are treated as black boxes in that, for the present moment, I am focused only on the spatial distribution of these phenomena and not the subtleties of and variations within these categories. These discussions are left for CHAPTER 6 (downtime) and CHAPTER 7 (emergency calls).
Data and Analyses

To examine these questions, analyses focus on three key distributions: (1) an “objective” measure of where EMS calls occur derived from the calls for service dataset (see CHAPTER 3, pp. 62-63), (2) a “subjective” measure of where EMS calls occur based on the interview sketch map data (see CHAPTER 3, pp. 59-61), and (3) a measure of where downtime occurs based on the EMS shift observations (see CHAPTER 3, pp. 56-59). Descriptive statistics for all three variables can be found in APPENDIX B. Both the measures of where emergency calls occur are analyzed using both quantitative and GIS methods, including the univariate and bivariate Moran’s I scatterplots described in CHAPTER 3 (see pp. 68-70), which are used to compare the ways in which the objective and subjective measures cluster in similar ways.

The final analysis using these measures of EMS call volume is a bivariate choropleth map (Fischer 1982), which is used to understand areas where providers both overestimate and underestimate call volume. Bivariate choropleth maps are best understood as 3x3 or 4x4 tables that compare two ordinal concepts. The included map uses “low” to refer to Census Block Groups where both the objective and subjective measures are within a standard deviation below their respective means. “Moderate” refers to Census Block Groups where both variables are within a standard deviation above their respective means, and “high” refers to Census Block Groups that are greater than a standard deviation above their respective means. The color pattern used in the data is a slight departure from typical bivariate choropleth maps in that it uses white for areas of the 3x3 table where there is “agreement” between the two variables - “low, low”, “moderate, moderate”, and “high, high” (see FIGURE 5.10, p. 285). Overall, 70.45% of Census Block Groups display “agreement” between providers’ perceptions and the EMS incidents variable. Only the 29.45% of Census Block Groups where there is some disagreement between the two variables are colored so as to make identification of patterns easier for the reader. The upper-left cells, those that are colored various shades of purple, are those where providers’ sketch map data underestimates the relative number of EMS incidents. The lower-
right cells, those that are colored various shades of blue, are those where providers’ sketch map data overestimates the relative number of EMS incidents.

The measure of downtime, the last of the three main variables of interest in this chapter, represents only downtime activities within the City of Chapman that included a destination. Downtime events where driving was interrupted were therefore not included in these analyses. Unlike the emergency call distribution, however, it is not possible to assess these data using Moran’s $I$ as a measure of the degree to which these events were randomly distributed throughout the City of Chapman. Moran’s $I$, like many frequentist statistics, relies on a calculation of variance as a key part of the test’s formula. Though there are fifty-nine valid addresses for downtime events, there are another approximately 21,000 address that have no valid observations. Thus the calculation of the downtime variable’s variance results in a number that approaches zero. Aggregating the data to Census Block Groups does little to remedy the situation, because there are so few Census Block Groups with valid downtime events that the data appear from the standpoint of the Moran’s $I$ to be randomly distributed because it is a measure of global clustering in the data. A qualitative analysis based on the map of these locations is therefore used in place of a spatial statistical analysis.

**The Distribution of Emergency Work in Chapman**

In order to better understand both the spatial logic of emergency calls within the City of Chapman as well the perceived distribution of this work, data from both the calls for service dataset (the “objective” measure) and the sketch map activity (the “subjective”) were mapped and analyzed together. The results of these analyses are described in this section, beginning initially with an objective measure of where EMS incidents occur before turning to a measure of provider perceptions of this phenomenon. This dual focus on both a measure of the phenomenon as well as the social-psychological perceptions of the phenomenon is inspired by Sampson’s (2012) emphasis on the ways in which shared perceptions or expectations help shape the identities and trajectories of different neighborhoods (Sampson 2012.ix). After these
variables’ distributions are described in depth, additional analyses to understand the level of agreement between providers’ perceptions and the objective measure of their work are detailed.

**An Objective Measure of Emergency Call Distribution**

The objective measure of emergency call distribution can be seen in FIGURE 5.2 (see pp. 277). All Census Block Groups have EMS incidents in them, though for a small minority there are only a dozen or so incidents per year. The heaviest concentrations of EMS calls are found in the Midtown area, particularly on the west side of Main Street, as well as in East Chapman and parts of North Chapman. There is also a cluster of EMS calls concentrated around The Old Quarter neighborhood. By comparison, portions of West Chapman and Uptown have relatively few incidents visible on the map. The visual assessment of these data reveals a certain spatial logic to EMS work insofar as it appears that EMS incidents are not randomly distributed throughout Chapman but rather clustered in specific areas.

However, it is possible that EMS incidents correlate strongly with population, meaning that areas of higher population have a greater density of EMS incidents than do those with lower populations. A scatterplot of the EMS incident data plotted with the population estimates for each Census Block Group (drawn from the 2008-2013 American Community Survey estimates for Chapman) reveals that this distribution is not heavily influenced by population size (see FIGURE 5.3, p. 278). The Spearman’s *rho* correlation, used because the distribution of this variable is not normal, reveals a moderate relationship between the number of EMS incidents and the population size (*rho* = .3934; *p* < .001) where only about 15% of the variation in EMS incidents is associated with population count. These data suggest that the clustering observed in
FIGURE 5.2 is driven by a phenomenon other than population density.¹

Spatial statistics are particularly informative here, in part because they help to assess the degree to which data cluster spatially since a visual inspection of FIGURE 5.2 (see p. 277) reveals a number of sharp differences in frequency from Block Group to Block Group. The Moran’s I statistic (see CHAPTER 3, pp. 68-70) for this distribution ($I = 0.1304; p < .001$) indicates that there is a less than 0.1% chance that this distribution is the result of random chance (see Notes on FIGURE 5.2, p. 277). In other words, the distribution of EMS emergency calls contained within the Chapman Police Calls for Service dataset is not randomly distributed, though the ‘global’ level of clustering is generally weak. This is reflected in the sharp differences from one Census Block Group to the next throughout much of the City. A companion analysis of these data using the Getis-Ord GI* statistic (see CHAPTER 3, pp. 68-70) reveals statistically significant hot and cold spots (see FIGURE 5.4, p. 279). The hot spot, which indicates a cluster of higher values of EMS incidents, includes a distribution of Census Block Groups that are significant across all three critical values. This hot spot includes a number of neighborhoods, including the Fulmore on the west, the very western end of Downtown, Midtown, and parts of Oxford.

These two analyses together suggest that EMS incidents are not randomly distributed throughout Chapman, but rather clustering takes place in particular parts of the City. Sampson (2012) describes this clustering as “spatial interdependence”, and much of the beginning Great American City is focused on the ways in which spatial clustering operates throughout a number of different processes (including crime rates, socioeconomic status, and racial diversity). For Sampson, “spatial interdependence” is the idea that neighborhoods that are nearby one another

¹ The validity of this finding was checked using an alternative measure, known as the Empirical Bayes Standardization for Moran’s I ($EBI$; see CHAPTER 3, pp. 68-70), which provides a statistically robust means for assessing spatial autocorrelation with data that represent a rate. Using GeoDa, the “objective” EMS incident rate for each Census Block Group was divided by the Block Group’s population and used to calculate a standardized rate. This rate was then used to as the basis for calculating $EBI$. The results ($EBI = 0.0278; p < .05$) suggest some global clustering of EMS incidents after accounting for population density. Readers are reminded that the $p$-value reported is based on a series of Monte Carlo simulations (see CHAPTER 3, pp. 68-70, for more information).
influence each other. This concept is similar to the ways in which interpersonal networks operate - individuals are influenced by friends, friends of friends, and even friends of friends of friends (Christakis and Fowler 2009). Similarly, Sampson argues that spatial phenomena can be influenced by the ‘neighbors of neighborhoods’ (Sampson 2012:237-240). He demonstrates the durability of this idea by comparing Moran’s $I$ scatterplots for four measures: residential stability, incarceration rate, perceived disorder, and collective efficacy (Sampson 2012:241), finding that neighborhoods that are high in any of these categories are likely to have neighbors that are also high, and that neighborhoods that are low in any of these categories are similarly likely to have neighbors that are also low (Sampson 2012:240-243).

A similar analysis of the EMS incidents data reveals statistically significant spatial interdependence, albeit at a weaker level than the spatial interdependence described in Sampson’s work (see CHAPTER 3, pp. 68-70 for a description of the Moran’s $I$ scatterplots). Accounting for the spatial weight based on contiguity as opposed to distance increases the amount of spatial autocorrelation from $I = 0.1304$ to $I = 0.2058$. The Moran’s $I$ value reported here is statistically significant, with a resulting pseudo $p$-value\(^2\) of $p = 0.003$. The scatterplot (see FIGURE 5.5, p. 280) of these data shows a large amount clustering among Census Block Groups that have a low amount of EMS incidents and who have neighbors that also have, on average, a low number of EMS incidents (the lower-left quadrant). There are a smaller number of Census Block Groups that have both a high amount of EMS incidents and whose neighbors also have, on average, a high number of EMS incidents (the upper-right quadrant).

These three tests of spatial autocorrelation (Moran’s $I$), clustering (Getis-Ord GI*), and spatial interdependence (the Moran’s $I$ scatterplot) reveal the non-random nature of EMS work in Chapman. Importantly, these findings do no appear to be driven by population density, meaning that other individual or ecological characteristics are responsible for the distribution of EMS work. Instead, they are driven by what FIGURE 5.5 (see p. 280) shows to be a subset of

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\(^2\) The $p$-values given by Geoda are referred to here as pseudo $p$-values since they are based on a number of permutations of a Monte Carlo simulation (see CHAPTER 3, pp. 68-70, for more information).
Census Block Groups that, along with their neighbors, have on average a high volume of EMS incidents. This clustering, which FIGURE 5.4 (see p. 279) shows to be located around the “Midtown” area of Chapman, provides empirical support for the notion of EMS work being an “extralocal” force (Sampson 2012) that is both spatially linked and interdependent.

A Measure of Perceived Emergency Call Distribution

An analysis EMS providers’ own perceptions of their work, as opposed to focusing solely on objective measures of this work, can illuminate important areas of agreement and discord that reveal much about the cognitive frames through which providers’ understand the spatial logic of EMS work. In this analysis, EMS providers’ views of the distribution of their work reveal a different pattern from the “objective” data (see FIGURE 5.6, p. 281). There are two pronounced clusters that are visible on the map, with the cluster that has higher overall endorsement rates centered on the Midtown area. The second pronounced cluster, which has slightly lower rates of endorsement, can be seen over The Old Quarter. The distribution shows some higher endorsement of the Census Block Groups in East Chapman and one of the Block Groups in North Chapman. There were three Census Block Groups in West Chapman that received no endorsement, meaning that no providers believed that they responded to calls in these Block Groups with any frequency.

When these data are analyzed using spatial statistics, a higher degree of ‘global’ clustering is observed with the Moran’s I statistic \( I = 0.4711; \ p < .001 \) than is observed in the “objective” measure of EMS incidents. This is reflected in the two pronounced clusters described above. As with the EMS incidents, the Moran’s I data suggest that there is a very small chance that these data are randomly distributed. An analysis of this same distribution using the Getis-Ord GI* test (see FIGURE 5.7, p. 282) shows a statistically significant hot spot over the Midtown and Fulmore neighborhoods. This hot spot extends south to cover the western end of the Downtown neighborhood as well as the Lower Goodman neighborhood closer to the Old Quarter. Importantly, this hot spot covers a much larger area than the hot spot identified in the EMS
incidents data, suggesting that providers’ perceptions of the volume of calls in Midtown extends to a wider set of Block Groups than the objective data would otherwise suggest. As with the analysis of the EMS incident data in the previous section, there is a statistically significant cold spot over much of North Chapman as well as parts of Uptown and West Chapman.

This analysis shows the strength of providers’ social psychological impressions of place. Such impressions are important since they are theoretically linked by Sampson (2012:63) to neighborhood effects. In his conceptual model of the ways in which macro and micro factors are linked, social psychological perceptions are mediating factors that connect neighborhood structure to individual-level actions (see CHAPTER 2, pp. 35-39). How a place influences an individual’s behavior is determined by the contextual production of these social psychological frames. Providers in this analysis have strong, shared perceptions of their work that cluster in particular neighborhoods of the city rather than being randomly distributed throughout Chapman. These data also support the “extralocal” description of their work since their perceptions spread across a number of Census Block Groups rather than focused on single, specific areas. The greater degree of clustering observed in the subjective data (as opposed to the objective data) suggests that there are differences between the social psychological impressions providers hold about the spatial distribution of EMS work and the objective description of EMS work used in this study.

Comparing the Objective and Subjective Measures

This suggestion, that providers’ perceptions differ markedly from the “objective” view of the spatial distribution of EMS incidents, can be assessed empirically to understand ways in which providers’ perceptions of the spatial distribution of emergency calls are related to the objective measure of this work. FIGURE 5.8 (see pp. 283) illustrates the degree to which these two variables are related to each other on a Block Group by Block Group basis. The overall relationship is a moderate correlation ($\rho = 0.5941; p < .001$). The scatterplot illustrates a number of important patterns in provider perceptions. In the bottom left corner of the
scatterplot, there is evidence that providers have a generally good sense of where their work does not occur. Many of the Census Block Groups that have low identification as part of ‘high frequency’ clusters also have low numbers of EMS incidents. At the opposite end of the spectrum there are two Census Block Groups that have both the highest number of identifications as part of ‘high frequency’ clusters and the highest overall numbers of EMS incidents. There are a substantial number of Census Block Groups, however, that providers perceive as being higher frequency areas than the EMS incident data would otherwise suggest. There are also a number of Census Block Groups where the opposite is the case - providers perceive them as being lower frequency areas than the EMS incident data indicate.

While the scatterplot illustrates the general patterns of agreement and disagreement between the two variables, it does not identify spatial clustering between these two measures of EMS work. Spatial clustering of agreement and disagreement can be visualized and measured in a number of ways. The Moran’s $I$ statistic that has been used to measure the overall amount of clustering (spatial autocorrelation) present in the data can also be used to identify clustering in a bivariate manner. FIGURE 5.9 (see p. 284) illustrates the relationship between the subjective measure and a spatially lagged version of the objective measure. The spatial lag is a measure of the average number of EMS incidents in contiguous block groups. Areas that are “high, high” represent agreement between the two variables, which can be interpreted as Census Block Groups that have been identified as high volume that are located in objectively measured high volume clusters. Block Groups in “low, low” can be interpreted in a similar fashion.

Perhaps the more interesting quadrants are those that show disagreement. These provide evidence that there are a large number of Census Block Groups that providers do not identify as having frequent responses, yet they are located in the objectively high volume clusters (the upper-right quadrant of FIGURE 5.9). In other words, these are areas where providers underestimate demand. Similarly, there are a small number of Census Block Groups that providers over estimate demand (the lower-right quadrant) since these Block Groups are part of
lower volume clusters in the objective measure but received relatively high levels of endorsement from providers.

A bivariate choropleth map (see FIGURE 5.10, p. 285; see also this chapter’s ‘Data and Analyses’ section) can be used to visualize the distribution of both agreement and disagreement between these two variables. There are two main areas where providers appear to overstate the relative number of EMS incidents: much of the Census Block Groups in the Old Quarter area, and the Census Block Groups to the north and west of Midtown. Of these two areas, a greater degree of disagreement in areas west of Midtown, where provider endorsements are greater than one standard deviation above the mean but the EMS incident count for the corresponding block groups is actually less than the mean. In the Old Quarter, providers’ endorsements are again greater than one standard deviation above the mean, whereas the EMS incident count for those block groups is less than one standard deviation above the mean.

There are a greater number of areas where providers underestimate the relative number of EMS incidents. The disagreement between providers’ perceptions and the count of EMS incidents is generally focused on four neighborhoods: Downtown Chapman, East Chapman, the Oxford neighborhood, and North Chapman. There are also a number of other scattered block groups where providers tended to underestimate the relative number of EMS incidents, including a block group located in West Chapman, a block group in the Uptown neighborhood, one in the Goodman Hill neighborhood, and one in the Fulmore. The block groups with the greatest disagreement are those where EMS provider endorsement was below the mean but the count of EMS incidents was greater than a standard deviation above the mean. There are two such locations in North Chapman, two in Downtown and East Chapman, and the lone block group in Goodman Hill.

The overall picture that this map gives is one where providers’ attention is drawn towards two particular areas of the city (the Old Quarter and Midtown) and away from other high volume locations, such as North and East Chapman. In both the Old Quarter and Midtown, some Census Block Groups show “agreement” while others show “disagreement”, just as in
neighborhoods where providers’ underestimate the call volume. Given this outcome, it is important to drill deeper into providers’ spatial perceptions in an effort do understand the driving forces behind the apparent “disagreement” between providers’ overall perceptions of their work and a more objective measure of EMS incident volume.

Interpreting Disagreement

The empirical evidence about the distribution of EMS work presented thus far suggests two conclusions: (1) EMS incidents in Chapman cluster spatially and (2) the social psychological impressions of the spatial distribution of EMS incidents differ from the objective measure. The second conclusion builds necessarily on the first, and there are two possibilities for the observed discord. The more compelling explanation is that discordance between providers’ perceptions of the spatial distribution of their work and the objective measure represents a cognitive bias that providers hold towards some areas of the City, and that this bias shapes not only areas were they correctly perceive high or low volume but also to contiguous Census Block Groups. This explanation is supported by Sampson’s (2012) argument about spatial interdependence. The durability of the evidence he presents, across both objective and subjective measures of neighborhoods’ ecological characteristics, suggests that misattribution by providers should not be simply dismissed as noise or artifact. Rather, it is a signal of how spatially interdependent social psychological processes can be. In this view, perceptions spill over Census Block Group boundaries to create more sweeping views of areas of the City has being “marked” in some way. This explanation also helps to explain under-endorsement by providers, as viewed by the various shades of purple in FIGURE 5.10 (see p. 285). Here, the concept of social psychological spatial interdependence explains the diffusion of perceptions of neighborhoods as low volume areas to neighborhood Block Groups, even those that are not actually low volume.

There are two useful connections to the urban and health literatures that suggest that bias is a real possibility and provide context for discord between perception and reality in different settings. The first comes from Sampson’s (2012) work on disorder and racial segregation finds
that observed rates of disorder do little to predict rates of residents’ perceived disorder. Rather, other factors such as the percent of African American or immigrant residents of a neighborhood are far more predictive of how residents perceive disorder in neighborhoods. Importantly, these findings extend to organizational leaders who are not residents of a community. This is similar to EMS providers in the sense that their perceptions are not the products of residential exposure but rather workplace experience (see CHAPTER 4, pp. 87-90). The “stickiness” of social psychological impressions identified by Sampson suggest that spatial disagreement between subjective and objective measures of social phenomena is the result of an important set of social processes from which biased perceptions emerge.

The second connection to the literature is known as “the clinician’s illusion” (Cohen and Cohen 1984). As it was originally presented by Cohen and Cohen, “the clinician’s illusion” is both a statistical and conceptual phenomenon. Its applicability here rests on its theoretical, rather than methodological, implications. “The clinician’s illusion” is the idea that providers’ perceptions of the patients they treat are driven by the duration of their illness. Cohen and Cohen (1984) note that the duration of illness in a population sample and a sample of patients at a particular clinical site have near opposite distributions. Thus, providers’ perceptions of what a patient’s experience or prognosis is like are driven by their own biased clinical sample as opposed to a population sample. For EMS providers, then, one such “clinician’s illusion” is the distribution of patients, a point returned to in CHAPTER 7. If providers’ perceptions include a view that certain types of patients are associated with certain neighborhoods, this may create an environment in which assumptions about the type of patient to be treated are preconceived in providers’ minds. This can manifest in a number of ways, such slowed response times if providers do not perceive the described call to be truly emergent. When they arrive on-scene and begin treatment, their ability to overcome any such preconceptions may also be challenged. The power of perceptions, even those conceived in error, to have real consequences has been long known in sociology as the “Thomas theorem” (Thomas and Thomas 1928). Both Berger (1966), Coser (2003) and others have built upon and demonstrated the durability of this phenomenon.
in social life. In medicine, the use of heuristics about patient populations (including “the
clinician’s illusion”) can produce biases that cause errors in clinical reasoning, which may
negatively impact patient recovery or mortality (Elstein 1999).

To return to the discord between providers’ perceptions and objective measures of their
work, it is also possible that the observed disagreement is driven by noisy artifact from the
sketch map exercise (see CHAPTER 3, pp. 59-61). Providers approached the sketch map exercise
differently, with some drawing large sweeping circles and others attempting to identify smaller
areas where calls appeared. Over-endorsement, as viewed either in the upper-lefthand quadrant
of FIGURE 5.9 or those Block Groups presented in various shades of purple in FIGURE 5.10,
could therefore be viewed as misattribution due to imprecise identification of areas by
providers. This is the less compelling possibility because it would seem to only explain over
endorsement but not the observed under endorsement, which is the more widespread of the two
phenomena. However, it is an issue that I return to in CHAPTER 9 (see p. 220) as a limitation of
this study.

The Distribution of Downtime in Chapman

Providers’ perceptions of EMS incident distribution are crucial given the potential for these
subjective frames to influence their interactions with patients. These interactions, however,
account for only perhaps a third of the observed ‘events’ during the EMS shift observations
phase of data collection (see TABLE 5.1, p. 276); the other two-thirds consists of downtime
activities. As with emergency calls, downtime activities are spatially distributed in important
ways (see FIGURE 5.11, p. 286). Focusing on this distribution matters for two reasons. The first
is that providers’ downtime is worthy of analysis in its own-right given that it constitutes such a
large amount of their daily activities. Downtime is also important, however, because providers
experience the city during calls but also during downtime, and so downtime becomes another
mechanism for building social psychological perceptions of place.
Over the course of the twenty shifts that made up the EMS shift observations phase of data collection, downtime activities were noted at a total of fifty-nine individual addresses within the City of Chapman. Note that these are considered the ‘valid’ downtime events in TABLE 5.1 (see p. 276), as opposed to events that did not have a noted downtime location because the driving segment of the downtime observation was interrupted by an emergency call. This is not to say that driving during downtime is not conceptually part of downtime as a phenomenon, but rather this type of downtime should be analytically separated for the purposes of understanding where downtime occurs. The overarching focus here are on the places where providers sit and spend time, whether ten minutes or an hour, rather than the known endpoints for each discrete downtime event. This decision rests on the notion that this type of downtime constitutes a great level of “exposure” to place because providers have the opportunity to soak in their surroundings.

The map of downtime addresses (see FIGURE 5.11, p. 286) uses graduated symbols to illustrate the number of individual downtime events noted for a given address. The larger the symbol, then, the more downtime events noted at a particular address. The map appears to show a clustering of downtime events around The Old Quarter neighborhood as well as at a location in North Chapman and a location in the Goodman Hill area near Tory Plaza. A tabulation of these data, using providers’ definitions of neighborhood boundaries, identifies these three areas as contributing to 86% of the downtime events observed (see TABLE 5.12, p. 287). The tabulation suggests that, despite difficulties in statistically accounting for clustering in the downtime data, there is empirical evidence of clustering that can be identified qualitatively. This finding speaks to the importance of mixed methods research on neighborhood effects. It also illustrates the ways in which the spatial scale of phenomena may differ even when those phenomena are interrelated.

This qualitative clustering of incidents is particularly important because it reveals the importance of a few discrete neighborhoods for EMS providers, and suggests that the criteria employed for selection downtime locations is an important facet of this discussion. Providers’
downtime decisions represent constrained choice. During the observations, providers were often
directed either to a specific area of the city, such as Uptown or Downtown, or were simply
instructed by dispatchers to “centralize” - make themselves available in the City’s midsection -
which entailed posting in the Old Quarter. This was done deliberately to decrease response
times since most parts of the City were easily accessible from this area. Providers for the most
part responded positively to this logic. As one provider put it - “it’s common sense to kind of
keep yourself centralized. So no one really strays too far out because it’s going to set you up for
failure when you get a call and you can’t make it there”. For providers there were real, or at least
perceived benefits to this system. Dispatcher instructions were vague, however, and left
providers a wide range of hypothetical locations within the designated neighborhood from
which to choose.

The notion that response times drive downtime decisions, however, is not fully supported by
the observation and interview evidence. In TABLE 5.12 (see p. 287), which summarizes the
locations of downtime events during the field observations phase of data collection, only 4% of
downtime events occurred in the Midtown neighborhood despite evidence presented earlier in
the chapter that there is widespread agreement between both the objective and perceptual
measures of EMS work that this is a high volume area. During the interview set mapping
exercise, 20% of the downtime clusters in the sketch map data occurred in the Midtown
neighborhood. This is a substantial difference, but there remains an overall trend that places
downtime outside of the Midtown area. Downtime locations could be seen therefore as not
influenced directly by call volume; if they were, we would expect to see a greater concentration
of downtime in the Midtown area. If expediency is not an explanatory factor in selecting
downtime events, and downtime does not appear (from a qualitative standpoint) to be randomly
distributed, then the motivating factors for selecting downtime locations deserve further
attention (see CHAPTER 6).

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Taken together, the data on the three key variables presented here - the objective and subjective measures of the distribution of emergency calls as well as the analysis of downtime event locations - suggest that EMS work in Chapman is focused (“clustered”) in particular parts of the city. For EMS incidents themselves, there are notable clusters where the number of EMS incidents outpace the mean in the Midtown area of the City. Importantly, the population count of Census Block Groups does not appear to be a major explanatory factor for this clustering given the weak correlation between EMS incidents and Block Group population as well as the statistically significant Empirical Bayes validity checks. Furthermore, providers’ perceptions of the spatial distribution of EMS work in Chapman differ in notable ways from the EMS incidents measure. They perceive the “hotspot” in Midtown to be much larger than the EMS incident data suggest, and the bivariate choropleth map further indicates that they also overstate the incidents of EMS calls in this neighborhood as well. This bias towards Midtown comes at the expense of accurately assessing call volume in other parts of the City, notably North and East Chapman. Providers’ attention appears focused on Midtown, though this is a descriptive assessment of these distributions.

The discord that these analyses identify is particularly important given prior work that finds perceptual factors to be more salient in understanding variation between neighborhoods than objective measures (Sampson 2012). The spatial logic of EMS work, to borrow from Sampson (2012), is one where both objective and subjective measures of EMS incidents as well as a measure of downtime for EMS providers are clustered in particular neighborhoods. The measures EMS incidents also reveal a degree of spatial interdependence that points to the importance of taking an “extralocal” view of EMS work as opposed to focusing solely on within-neighborhood analyses. Provider perceptions appear to be driven by a “spillover” from neighboring Block Groups rather than focused on specific areas. Both the apparent spillover and discord among provider perceptions are returned to in CHAPTER 7, which retains a “birds eye” view of provider perceptions of their work but identifies particular aspects of that work that are perceived to cluster spatially. The specific bias providers have towards Midtown is the subject of
CHAPTER 8, which traces the development of an intersectional neighborhood stigma that cuts across illness and place.

Beyond their emergency work, providers’ downtime is also subject to a spatial logic that is at least in part driven by structural conditions imposed on them by the need to stay “centralized” in order to minimize response times. This accounts for the overwhelming concentration of downtime on The Old Quarter and Tory Plaza neighborhoods. However, providers retain significant autonomy in selecting specific downtime locations. The importance of this autonomy for EMS work and the impact of place on the nature of downtime, are discussed at length in CHAPTER 6 before a conceptual return is made to the distribution of EMS incidents in later chapters.
CHAPTER 6: Hurry Up & Wait - Passing Time and Avoiding Conflict During Downtime

In the previous chapter (see CHAPTER 5, pp. 94-95), the substantive division between calls and downtime was introduced as a fundamental feature of Emergency Medical Services work. In this chapter, I build on those analyses by focusing on downtime and, in particular, on the ways in which social and spatial context structure downtime activities. As some workplaces transition towards “innovation” spaces and other non-standard work arrangements, this focus on the importance of where work occurs takes on additional import. This chapter addresses the first research question (see CHAPTER 1, pp. 18-19) by focusing specifically on how place structures providers’ daily downtime work routines. The chapter begins with a description of downtime in EMS work, focusing on a particular shift (Shift “99”) to illustrate the variety of ways in which providers spend time between emergency calls. This focus on downtime is analyzed through an application of Perlow’s (1999) sociology of work time.

In the second part of the chapter, Perlow’s sociology of work time is expanded to bring additional focus onto the sociospatial nature of work by placing the social context of work into a broader spatial context, complementing and expanding her theory in a way that ultimately increases its scope and applicability. This expansion of Perlow’s work builds upon her engagement (1999:77) with Gidden’s ideas about “institutional time” (1984:34-37) as well as
Goffman’s (1959) notion of front and back stages. I combine Goffman’s and Giddens’ ideas with Perlow’s existing framework, and used this expanded sociology of work time to understand how space both constrains and facilities how providers spend their downtime during shifts. In this section, I introduce the term “focal points”, which are four specific locations in the City that see the highest amounts of downtime traffic. These spaces are worthy of increased attention because they form the bulk of a number of downtime activities. These sites are critical, I argue, for building “occupational communities” (Van Maanen and Barley 1984) through which workplace norms and cultures are disseminated. Space also presents a barrier for building these communities in mobile occupations, which providers address by staying connected through smartphone applications during their shifts.

In the final part of the chapter, I describe a conflict over a “focal point” space that was particularly important to providers. To understand this conflict, I borrow the concepts of ‘primary’ and ‘marginal’ space from the literature on the sociospatal exclusion of the homeless (DeVerteuil et al. 2009; Stuart 2014) to understand the spatial exclusion of EMS providers from a particular area of Chapman. Instead of primary spaces defined in terms of their hostility towards the homeless, primary spaces are conceptualized as urban areas where the presence of first responders is unwelcome. Private Ambulance’s ejection from a particular primary space, which had to that point been one of the most common downtime locations, serves as both an example of sociospatial exclusion as well as a means for understanding the importance of posting locations for EMS providers.

The implications of this focus on the sociospatial context of work extend beyond EMS work given the substantial changes to modern workplaces. These changes include a rise in precarious employment arrangements like contracting or freelancing that is often termed “contingent work” (Kalleberg 2000; Kalleberg 2009). Such workers may find themselves without regular access to office space, working from home, or from a local coffee shop. At the same time, technology firms and others have focused on the creation of “innovation labs” or “innovation spaces” (Lewis and Moultrie 2005; Magadley and Birdi 2009) that radically restructure and re-
conceptualize the traditional office layout. Yet the spatial constraints that these types of work environments place on employees have received little attention from sociologists. Focusing on how workers make use of time in non-standard work environments, and the way variation in the environment itself impacts that time, can therefore have implications for a variety of workers beyond first responders.

**Data and Analyses**

This chapter brings together three different aspects of data on downtime. The primary focus is on the geocoded field note locations (see CHAPTER 3, pp. 56-59) along with the qualitative data that focused on downtime (see CHAPTER 3, pp. 56-61). As with the previous chapter, the focus here is on the downtime events (n=276) that occurred at a specific address (n=59). The small number of downtime events that occurred outside of Chapman are not included in this measure. Downtime that did not have an endpoint where providers parked and carried on downtime activities are similarly excluded since the focus on this chapter is on providers’ use of posting locations for downtime. Descriptive statistics for this variable can be found in APPENDIX B.

The field notes for these downtime events (n=276 events) were coded for emergent themes (Charmaz 1983; Glaser 1978) using the process described in CHAPTER 3 (see “Qualitative Analyses”). This analysis identified seven major types of downtime activities, each of which became a single code for the purposes of qualitative analysis in Dedoose. The seven types of downtime activities identified were: (1) bathroom use, (2) dining, (3) personal errands, (4) socializing, (5) sleeping, (6) driving, and (7) working on paperwork related to calls. Through the process of applying and refining these codes with the interview transcripts identified several additional emergent themes, including autonomy as an important facet of downtime and providers’ ideal conceptions of how downtime could be spent. The resulting quotes, which were pulled from both field notes and interview transcripts for all of the downtime codes, form the analytical backbone of this chapter. By integrating these codes back into the data warehouse (see
CHAPTER 3, p. 64), individual types of downtime can be both mapped and described using a variety of analytical approaches.

One additional data source was used in this chapter. The data from the EMS shift observations included turn-by-turn travel route data (see CHAPTER 3, pp. 56-59) for the entirety of each of the twenty shifts observed. When combined with other qualitative data collected during one of these shifts, Shift “99”, these data provide a time-geography snapshot of each shift that can be viewed both as a table (see TABLE 6.1, p. 288) and a map (see FIGURE 6.4, p. 292). Together, they illustrate the entirety of Shift “99” both temporally and spatially.

**Downtime in EMS Work**

As I noted CHAPTER 5’s section on “The Substantive Logic of EMS Work” (see pp. 94-95), downtime encompasses a wide range of activities. Some of these are purely personal, such as running personal errands, while others are fully related aspects of EMS work such as working on paperwork, running errands for dispatchers, or engaging in professional development activities. Downtime is therefore conceived of as an umbrella that covers a wide range of work and non-work activities. While such a diverse set of activities may differ from a cashier or a waiter on their lunch break, ‘break’ or ‘down’ time is a common aspect of many workplaces. During EMS shifts at Private Ambulance, there is no break structure that is analogous to the types of scheduled breaks common in other workplaces. Other studies of first responders (e.g. Desmond 2007) illustrate the ways that shifts ebb and flow, with periods dedicated to work and periods dedicated to non-work activities. The following sections describe these ebbs and flows within EMS providers’ shifts by detailing one shift, Shift “99”, with an eye towards the sociospatial context within which these activities occur.¹

¹ Shift “99” was selected for discussion here because it contains downtime elements that are common throughout the observation shift notes. It is therefore a good representation of the general pattern of downtime that Private Ambulance providers go through each shift. Though there are commonalities across shifts, no two shifts in the sample were identical save for the fact that they each began and ended at Private Ambulance’s headquarters. Each shift had its own personality and flow to it, so discussions of “representative shifts” should be understood as focused on common elements.
Shift “99”

Shift “99” (see TABLE 6.1, p. 288), as with the other shifts observed, shift began in Private Ambulance’s headquarters before the crew headed out “on the road”. Once “on the road”, providers alternated between calls (highlighted in grey) and downtime events throughout the shift. During Shift “99” a total of ten hours and forty minutes, or 65.2% of the shift, was spent on downtime activities. This matches the ratio seen across all twenty shifts that comprised the EMS shift observation period (t=279 hours), where 181 hours (64.6% of the time) was spent on downtime activities. Downtime is notable therefore because it is such a defining feature of shifts - providers spend more time in or near their ambulances between calls than any other single activity during their workday.

The descriptions of downtime during Shift “99” illustrate a number of important points, including the ways in which downtime is not a static activity but a mobile one. The majority of downtime activities, as with most of the downtime activities in Shift “99” (except events 16 and 28), involve driving. Overall, 88.1% of events during the twenty observed shifts involved some sort of driving as opposed to the 11.9% that were wholly stationary events. As Shift “99” shows, this could be driving back into the City of Chapman from a hospital that is outside of the city, or it could be driving across the City with a specific destination in mind such as a restaurant or a particular posting area. Driving in a minority of events on shifts other than Shift “99” was done simply for the sake of driving with no stated destination.

Shift “99” also illustrates the ways in which downtime was not “break” or “idle” time for providers - it is very much part of their work time and often involved multiple different activities. At various points during the shift, providers were asked to “post” or “provide coverage” for the Downtown area of Chapman. The providers also used downtime to complete paperwork for previous calls (or “jobs”). Providers also engage in downtime activities with the full knowledge that they could be interrupted at any moment, as in Shift “99” when the crew’s first attempt at securing breakfast was interrupted by their dispatch to an inter-facility transfer. Shift “99”, then, illustrates the complexity of speaking about “work time” and “downtime” as I
do in this chapter - downtime is structured as part of providers’ work time even if they have a degree of control over how they spend that time.

Downtime Activities

This tension between “work time” and “downtime” can be seen in the range of activities that providers engage in during downtime activities (see TABLE 6.2, p. 290). Broadly, these activities can be grouped into three types: (1) purely personal, such as running errands, (2) activities that help providers through their long shifts, such as eating and sleeping, and (3) purely work-focused, such as running errands for dispatchers or completing paperwork. Each of these are illustrated by Shift “99”, which began with personal errands that Nora, one of the two Paramedics, had to run. Our first stop of the morning was a drug store located in a strip mall nearby. Nora went into the back to purchase some toiletries while Charlie and I bought coconut waters and Charlie bought a copy of the New York Times. This particular downtime event also illustrated the fuzzy boundaries between the three categories noted above - it was purely personal in the context of Nora’s errands, but also involved purchasing drinks and a New York Times, which are perhaps better described as self-care.

Activities that help providers through long shifts, such as sleeping, eating, and staying entertained, are a major element of downtime. During Shift “99”, there were trips between calls to get breakfast, lunch, and dinner at a variety of takeout restaurants or neighborhood grocery stores. Providers occasionally brought food from home, but more often than not, as in Shift “99”, meals were picked up on the go when there was time during shifts. Typically providers would select a restaurant together, though there were instances when providers each had different ideas about meals and downtime was spent going to each of those restaurants. There is a downside to splitting restaurants for providers though, because downtime length is not predictable and there is no guarantee that both providers would be able to eat. The negotiation over where to eat and, more broadly, how to spend downtime illustrates the social context
within which downtime occurs. Providers work off a set of shared norms that govern priorities during downtime and emphasize the need to be accommodating to partners.

Shift “99” also illustrates the flexibility providers have with downtime. If errands need to be run, such as picking up toiletries from a convenience store, providers often have the ability to run those errands. Providers also have the ability to sleep if they would like, which is another essential element of managing the length of shifts. At several points during Shift “99”, including after breakfast, one or more of the providers napped in the ambulance. During the interview phase of data collection, a provider noted that sleep is imperative, especially on long shifts such as “24s”. During downtime, this paramedic would “usually get some sleep in there, maybe take a nap if I can. If I’m going to be on a twenty-four, then I definitely try to get a nap in.” The unpredictability of EMS work makes napping particularly important, because there are no guarantees that the overnight segments of shifts will be quiet and restful.

A third element of self-care that was ubiquitous during shifts was the use of personal electronic devices - typically smartphones and tablet computers. These devices were often connected to the internet through the wireless hotspots installed in the cab of each ambulance. Every provider I rode with or interviewed had a smartphone, and 40% of those interviewed also reported having an iPad or Kindle that they used at work. During Shift “99”, Nora had an iPad with her that she routinely used during downtime activities. Providers use these devices for a range of activities including accessing Netflix-style streaming services, reading, using the internet, checking Facebook, texting with friends, and playing games. When pulling into a downtime location, checking smartphones was often the first thing that providers would do once they were parked. Some providers also used their smartphones to stream music through the ambulance’s stereo system while we drove or sat at a post.

Finally, downtime during shifts consisted of the third group of activities that were purely work focused. These periods also allow providers to run errands for the company itself, such as picking up factsheets from area hospitals to facilitate billing patients, fueling ambulances, taking ambulances in need of maintenance or annual inspects to the mechanic, or delivering chocolates
to area Emergency Departments during the holidays. These are all necessary tasks for the company itself that providers support during their time between calls. Providers also use downtime to complete “jobs” - the patient care reports that they write up for each patient they make contact with. These are completed using “toughbook” type tablet computers, which transmit data via the wireless hotspot in each ambulance.

The Utility of Downtime

The range of these activities has important functions within EMS work. The first, and arguably more important of the two functions, is that downtime serves as a mental and physical break between what can be a demanding workday for many providers. One way of understanding how demanding shifts can be is through providers’ discussions of the “flow” or “pace” of shifts. During the semi-structured interviews (see CHAPTER 3, pp. 59-61), providers identified the pace of a shift (though not always using the word ‘pace’) as an important factor in whether a shift was “good” or “bad”:

CP: ...what’s a good shift?

Sam: A good shift? There’s the, you know, the white rhino of an EMS shift is probably busy all day... so you know it makes ... [the] day go by. You’re occupied. You’re not really bored sitting around whatever and then sleeping at night. Getting a good amount of sleep. You know, getting a call or two, but that’s about it. That’s a pitch perfect EMS shift. Pretty rare.

Some providers cautioned, however, that “busy during the day” was a relative term - it was possible to be so busy that it was “brain numbing”:

Sam: Brain numbing? Uhhh [laughs]... [the busiest] shift I ever worked would be an example of that. We did a 24 on a Friday [and] I did 27 calls in a 24...23 of them were ALS so it’s like full work up...25 of them were transports and then we got held three hours after the shift for [a] 4 alarm fire... standby. That can be brain numbing.

Other providers specifically cited downtime during their discussions of a “good” shift. One provider described it as the “lull” that they needed to give them a breath during a shift:

Dwight: ...most of the time you feel like you’re getting your nuts kicked in for 24 hours. [It’s] busy during the day, sometimes you don’t have enough time to think between calls. You’re just constantly moving...but it feels like
right before you reach your breaking point there’s a lull and then you kind of just chill out...

These quotes illustrate the ways in which a shift’s pace can dictate so much of a provider’s day. If the pace of a shift was too fast, there were many calls or calls that came in one after another, providers could feel ‘brain numbed’ or like they were pushed to their “breaking point”.

These quotes underscore the role that downtime plays in offering a mental and physical break for many providers. A period of rest is all the more important when work periods stretch to twenty-four hours or longer as in the example that Sam gave above, when they were held three hours after their shift while they stood by at a large structure fire. To borrow from Perlow’s (1999) model, this ‘pace’ is the temporal context that providers’ work time is governed by. This temporal context hangs over providers, who are constantly aware that they may not have time to accomplish whatever it is that they are doing:

Seth: ...the thing about it ...it’s like, all right, you’re anticipating, you’re just like [in] constant anticipation... like I better get this done because I’m not going to have a chance to do it because we’re busy, and anticipating the next call...

Alternations to the temporal context (changes to the pace or flow of a shift) mean that providers’ downtime takes on different levels of import with sleeping and eating becoming more or less priorities depending on how the shift progresses.

There is a second function to downtime as well. EMS providers have relatively little control over their work environment. They cannot control the pace with which they see patients, where those patient contacts take place, and may not have the time to step out for a lunch break or a nap before returning to the grind. They receive their directions via dispatchers who control much of the daily workflow that EMS providers are subject to. During our initial drive to get breakfast on Shift “99”, Charlie dryly paraphrased John F. Kennedy by saying “ask not what your dispatcher can do for you”. These are important points because they underscore the lack of autonomy that providers experience during their workday. Downtime becomes a temporal space that providers have a large degree of control over. If they want to people watch, nap, or eat, those are all options that are available to them until the next request comes in from their
dispatcher. Thus, the dining decisions made during Shift “99” for breakfast (events 3 and 5), lunch (events 13 and 14), and dinner (event 25) were all choices providers made based on their mood and what types of food they were interested in. Downtime is not just a mental and physical break, but a chance to exert control over what often a work environment that providers have little control over.

*Downtime and Perlow’s Work Time Model*

The variation in how providers spend downtime, the ways in which these activities are dependent on partners and dispatchers, and the temporal nature of downtime are all components of Perlow’s sociology of work time. Perlow (1999:78) illustrates the connections between interdependent work patterns, the temporal context of work, and the social context of work that shape employees’ use of work time. An expanded version of Perlow’s (1999:78) original schematic is presented here (FIGURE 6.3, see p. 291; see FIGURE 2.2, p. 255, for a rendition of the original). For EMS providers, Shift “99” illustrates the ways in which work patterns operate on two levels: between dispatchers and crews, and within crews themselves. Dispatchers govern the distribution of EMS work among the ambulance crews they oversee, doling out calls to the closest, most appropriate ambulance and ensuring that different areas of the city are adequately “covered” by an ambulance to reduce response times to that area. All of this is accomplished through the spatial tracking of ambulances whose locations are relayed from GPS units mounted in each ambulance’s cab to dispatchers via cellular hotspots in each ambulance. These data are displayed on large flat screen TVs in the dispatch area (see CHAPTER 4, pp. 84-85). In Shift “99”, the dispatcher on duty that day kept “P7” covering “downtown” Chapman for much of the day.

The interdependence of work patterns also exists between partners. During Shift “99”, Nora had errands to run (picking up toiletries from a drug store in North Chapman) and also had specific ideas about where she wanted each breakfast. Later in the morning, she stopped and sat while Charlie and I went into a chain Mexican restaurant to buy lunch. There is some give and
take, therefore, between providers over how downtime is spent. Providers try to accommodate each other during downtime as best they can given the constraints imposed on them by dispatchers. This accommodation and decision making process is the second element of Perlow’s (1999:78) model - the social context of downtime. As Perlow (1999) notes, the social context refers to shared norms and values that govern work time usage. In EMS work, there is a spirit of accommodation and a recognition that certain downtime activities, like eating meals, are important activities that need to be given priority during long shifts.

The third element of Perlow’s (1999:78) model, the temporal context of work, is perhaps the most unique facet of EMS work. EMS providers, like other first responders (fire fighters and police officers), work in a temporal environment where they are essentially on standby for their entire shift, waiting for the next emergency call to respond to. One provider described this as a “hurry up and wait” scenario, where providers have no idea when they will receive the next call (this is what Seth referred to in the previous section as “constant anticipation”). The temporal nature of downtime is therefore fluid and unpredictable. Shift “99” illustrates this well, with some downtime events lasting only six or seven minutes while other periods last for an hour or more. Providers’ decision making over how to spend downtime therefore operate on an assumption that they will be interrupted. During other shifts, attempts to get lunch or dinner would be repeatedly interrupted by calls, as were other downtime activities.

Taken together, these three elements of Perlow’s model (1999) summarize the major themes of downtime in EMS work as illustrated by Shift “99”. Perhaps the defining feature of downtime for EMS providers is that it is temporally unpredictable and can be interrupted at any moment. Downtime activities are thus undertaken with the knowledge that they could well be interrupted, as was our breakfast during Shift “99”. Importantly, downtime is not idle time, and a wide range of activities are common during downtime. Engaging in these activities requires the cooperating of both providers as well as dispatchers who can designate ambulances to cover certain parts of the city, therefore limiting providers’ choices in where they spend time. Downtime also serves two important roles in EMS work - (1) it provides a necessary mental and physical break from
the demanding task of providing patient care and (2) gives providers autonomy over their own work in ways that providing emergency care does not.

**Space, Place, and Downtime**

The version of Perlow’s (1999:78) model presented in FIGURE 6.3 (see p. 291) offers an additional nuance, related to the previous section’s initial reference to the mobility of downtime. The social context of downtime in FIGURE 6.3 (see p. 291) is situated within a broader spatial context. For EMS providers, their ability to engage in downtime activities is governed not only by the shared norms (social context) and the unpredictable temporal context of work, but also by the spatial context. EMS downtime, then, is impacted by where it occurs within the city, with certain activities concentrated in particular neighborhoods. This spatial context represents an extension of Perlow’s work in ways that give it greater applicability in mobile or non-traditional work settings where the site of work itself may vary.

This section expands Perlow’s model by building on her initial engagement with Anthony Giddens’ concept of institutional time (what he calls institutional *durée*), which appears as part of his theory of structuration (1984; see CHAPTER 2, pp. 40-41). Giddens’ use of time-space developed out of his engagement with and criticism of Hägerstrand’s (1976) time-geography. In his work, Giddens emphasizes the general ways in which individuals and institutions interact across space and time. His treatment of space is abstract, however, and generally less developed than his treatment of time (Urry 2011). Nevertheless, the overarching emphasis that he places on looking at social phenomena not in single, cross-sectional views but rather as embedded within spatial and temporal trajectories (or “paths” in the language of time-geography) provides a useful starting place for expanding Perlow’s model.

*The Concentration of Downtime Activities*

The idea that downtime is both temporally and spatially located has two consequences for our view of EMS work. The first is that downtime is, as I have noted previously, not a static
activity but rather a mobile one. Providers’ discussions of “flow” in the previous section, which point to the turnover between calls and downtime, and then back to a call and so on, are the embodiment of this idea. The “temporal context” (Perlow 1999) therefore is not only unpredictable, as Shift “99” shows (see TABLE 6.1, p. 288) but it is fluid, meaning there is both a rhythm to shifts themselves and a repetitive cycle from call to downtime and over again. This “flow” across time and space can be visualized (see FIGURE 6.4, p. 292) using the alternative cartography of Chapman used in previous chapters as well as the turn-by-turn data collected during Shift “99” (see this chapter’s ‘Data and Analyses’ section, pp. 114-115). FIGURE 6.4 outlines the ambulance crew’s movement throughout their shift, describing both the types of actions as well as the order in which those actions occur. Among other things, FIGURE 6.4 illustrates the constant spatial exposure that providers experience during their shifts. Downtime is therefore important not only in its own right as a major element of EMS providers’ work time, but also as a site through which spatial knowledge can be generated, reified, or refined.

The second element of consequence from Gidden’s work is the idea that daily routines not only unfold over space and time but they are both enabled and constrained by the spatial and temporal context they occur in. Time is a key constraint here since, as I have previously noted, the amount of time available to providers is a constant unknown. Interruptions are frequent and anticipated, meaning that thought must be given to even the smallest details such as the portability and preparation times of a meal. I learned this lesson one night while riding with two Paramedics. I joined one of them in purchasing dinner from a pizzeria named “Sirgi’s”, which was located in The Old Quarter and popular with Private Ambulance’s crews. The Paramedic I was with ordered pizza slices, which were available right away, while I ordered a sub that took time to prepare. We were interrupted by a call, meaning that she had time to eat half of the pizza she had purchased while I was still waiting for my as yet unfinished meal. This resulted in a healthy amount of (joking) criticism by the Paramedics and a return trip to Sirgi’s after the call, which was mercifully quick since we were cancelled by police who arrived on scene first and could not find the patient.
Chapman’s neighborhoods can also serve to enable or constrain downtime. For instance, Sirgi’s is one of many restaurants in The Old Quarter. Importantly, this density includes many restaurants that could be described as “fast food” - a neighborhood with a high density of fine dining establishments would do little for EMS providers who are constrained by time. A broader analysis of dining by providers, particularly events where at least one provider visited a convenience store or restaurant to purchase food, illustrates visible clustering of these events in The Old Quarter (see FIGURE 6.5, p. 293). Beyond the institutional imperative of remaining “centralized”, this clustering may reflect providers’ preferences for dining. This is revealed in the following field not excerpt:

Shift 518, Note 19:
[The dispatcher] calls us, asking us to stage in [Midtown]. Harrison and Micah start to talk about what they want for dinner. Both providers express frustrations about being posted there. They go through their [Midtown] food options, which are already limited according to them but even more so since we already at [Shwrma Cafe] today. They talk about going to [a burger chain], and mention that pizza is an option but they don’t like [the pizzeria’s] pizza all that much. Both providers agree that they’d rather go to [Uptown Plaza] and eat at [Sirgi’s pizzeria]. Micah calls [the Dispatcher] on his cell phone and asks if they can go grab dinner in [the Old Quarter] first. [The Dispatcher] agrees, and we get into the ambulance.

Downtime patterns related to patronizing restaurants should not be seen as wholly determined by the need to stay centralized. Rather, the Old Quarter is a neighborhood where dining is not viewed as constrained as the two providers above view their options in Midtown. During the course of the shift observations, providers patronized a number of coffee shops, two different local grocers, two pizzerias, and several burger joints in the Old Quarter. In Midtown, for comparison, providers limited their dining to a single cafe located near the Midtown fire station.

Dining is not the only downtime activity with its own spatial logic. In fact, a number of the emergent categories identified through qualitative analysis as downtime activities show varying degrees of concentration (see TABLE 6.6, p. 294). Some activities are concentrated at only a few addresses while others are disbursed among many or most of the addresses downtime occurs at. Providers engagement in errands, whether for personal purposes or at the behest of a dispatcher, also show concentration in a number of areas, particularly in North Chapman, The
Old Quarter, and the Tory Plaza area of Chapman (see FIGURE 6.7, p. 295). The clustering in North Chapman reflects a number of services that Private Ambulance works with on a regular basis to keep their vehicles running smoothly and a gas station where Private Ambulance maintains a corporate account. Other activities, such as bathroom use and sleeping, show tighter patterns of concentration. Bathroom use, which was not a trivial activity when providers spent hours in an ambulance at a time, was also highly concentrated on a small number of locations (see FIGURE 6.8, p. 296). In fact, providers’ use of restrooms was limited to just seven addresses out of the total n=59 downtime addresses. Of these seven addresses, only three were used more than once. Sleeping, similarly, is limited to eight addresses but only occurred with regularity at four (see FIGURE 6.9, p. 297).

The differing patterns for dining, errands, sleeping, and bathroom use (see TABLE 6.6, p. 294) suggest that these activities are facilitated or enabled by different spaces. A neighborhood’s propensity to offer ample dining opportunities may not be reflected in the quality of public restrooms. Similarly, areas where errands are common differ from areas where dining is concentrated. Providers’ ability to exercise autonomy over these varying downtime activities was mediated by dispatchers. When dispatchers request certain posting locations, such as in the field note excerpt included above, this could serve to cut providers off from areas they prefer to engage in particular activities. This highlights the largest consequence of a spatial view of work time, which is that an understanding of time use in mobile or non-traditional workplaces must also consider how the location of these activities impacts the ways in which they are carried out. Some locations or workspaces may facilitate particular types of work better or more easily than others, a point which may be missed if researchers are not sensitive to how space impacts work routines.

Focal Points

For Private Ambulance providers, there were specific areas of Chapman that had particular import for how downtime was spent and structured. These areas, which I refer to here as “
“focal points” since they served as hubs for downtime activity, facilitated and enabled certain types of downtime activities. The conceptualization of these “focal points” is roughly parallel to what Giddens calls “stations” (1984). Bryant and Jary (1997) describe these ‘places’ as locations that bind time and space for individuals - “stations” provide meaning for social interactions as well as both enabling and constraining individuals’ actions. Stations, according to Giddens, can be something as simple as rooms within a house or the home itself. The term “station” is not used here in-part because it also has a specific meaning in the context of Emergency Medical Services, where it refers to locations that ambulances are physically housed or “stationed”. Another reason to part with Giddens’ term is that any space is a station, meaning that no distinction is drawn between spaces that may be more or less important in a particular context.

For EMS providers, not all locations in Chapman were created equal. An analysis of the frequency and type of downtime events by location reveals four addresses that together accounted for two-thirds of downtime activities (see TABLE 6.10, p. 298). When the particular downtime activities were tabulated by focal point, a general trend emerged - these focal points were the site of a large proportion of each activity for providers (see TABLE 6.11, p. 299), particularly for the use of bathrooms, for sleeping, and for socializing. Thus, while the overall distributions of particular downtime phenomena varied spatially in different ways, these focal points served as magnets that enable many of these activities in a single place.

A closer examination of socializing that occurs at these locations also illustrates the broader context and importance of these locations. These four locations accounted for 80% of all of the socializing crews did with each other and other medical providers during their shifts (see TABLE 6.11, p. 299; for the spatial distribution of socializing during downtime see FIGURE 6.12, p. 300). These focal points had a number of common features. They offered parking for multiple ambulances and, Private Ambulance’s headquarters aside, they were centrally located within the City of Chapman. They fulfilled the functional requirement of providing coverage to the city while at the same time allowing providers to socialize with each other since multiple crews could occupy the same post.
In North Chapman, the main focal point was Private Ambulance’s headquarters itself (24% of all downtime events; 73% of North Chapman downtime events). Though providers did not typically return to the headquarters during their shifts, they started and ended their shifts there. This meant that providers would often cross paths at shift change both with co-workers who were on duty during the same time period and others who worked before or after a particular shift:

Seth: ...you see everyone [who works at Private Ambulance] every day, you know what I mean? The shift going off that’s probably an eighth of our workforce every time, every morning that leaves. And then a new crew comes in, so you’re just constantly seeing people.

Passing each other at Private’s headquarters could be the only time that providers on the same shift cross paths if a shift is particularly busy. Additionally, there was always an ALS ambulance crew based there on the overnight. There was therefore ample opportunity to interact face-to-face with colleagues, dispatchers, and EMS supervisors here. This quote also offers a glimpse into the distinction between individual time and institutional time (Giddens 1984; Perlow 1999). Individual shifts began and ended throughout the day, with providers constantly churning in and out of Private’s headquarters. A single provider’s shift was therefore nested within an larger institution that operated around the clock, a cycle that evokes Gidden’s (1984) notion of individual and institutional time.

There were also regular training opportunities that providers are expected to attend, such as monthly trainings known as “rounds”. These events gave providers both the continuing medical education that their certifications require but also a catch up with co-workers. At one such rounds I attended during the EMS shift observation phase of data collection, providers ate breakfast together, joked with each other about calls from the previous week, and whispered side comments to each other about the presentation. These events became additional shared experiences where providers were able to develop a sense of community with each other.

In Tory Plaza, the Mather Hospital, which was described in CHAPTER 4 (see p. 83) as the main safety net hospital for the City of Chapman as well as a location where Private Ambulance maintained a bunkroom, was the main focal point (17% of all downtime events, 84% of Tory
Plaza downtime events). In addition to the bunkroom, providers would congregate at the nurse’s station in the Emergency Department to socialize both with each other and hospital staff, and in the ambulance bay outside of the ED. The bay was really a driveway with space for six or more ambulances to be stacked up one behind the other. Though providers were not encouraged to spend time here during the day, they frequently transported patients here. Of the 109 calls observed that resulted in transport to the hospital (out of n=160 total emergency responses observed; n=134 patient contacts), 31% were transported to the Mather Hospital - a rate twice that of the next most common medical center (Muir Hill Hospital in West Chapman). Thus, after patient care was completed, providers had an opportunity to interact with their colleagues and take their time cleaning their equipment before heading back out on the road. This was the case during Shift “99”, where the crew sat outside of the ambulance and chatted with other ambulance crews as they arrived to drop patients off or take patients away.

In addition to Private’s headquarters and the Mather hospital, there were two other focal points in the Old Quarter. One was an observed focal point, the other was reported as a focal point during the interviews. Eaton Plaza (14% of all downtime; 42% of all Old Quarter downtime), which is discussed in greater depth in the next section, was one of the most common downtime locations during the first two-thirds of the shifts observed, when it accounted for 57% of all downtime in the Old Quarter. However, it became untenable for ambulances to post there and its share of overall downtime dropped during the last third of the shifts observed. It was replaced to some degree by an alternate post where providers reported an increased amount of socializing taking place during the structured interviews. An increased use of this post, called “City Park” here, was noted during the final third of the shifts observed, but it did not contribute to a significant quantity of the socializing during those shifts. The providers during Shift “99” parked here towards the end of their shift when they waited for the dispatcher to request for them to “60” - return to the headquarters for the evening.

Socializing at these focal points could take on various forms. One weekend afternoon at the Mather, five of us sat in the back of one paramedic ambulance parked in the ambulance bay.
Providers chewed tobacco, spitting into doubled-up pairs of nitrile exam gloves, and talked about patients as well as iPhone applications they found humorous. During the interviews, one provider described similar impromptu gatherings in the back of an ambulance to watch movies:

Harrison: But those are, you know at night when it’s slow, sometimes we’ll all, if it’s slow enough where we can all meet up, sometimes someone who has one will just put on a movie on Netflix and sit in the back of the truck and watch it.

At other points during the shift observations, particularly at Eaton Plaza, providers would congregate around one ambulance, standing outside the cab and talking about their shifts or topics unreleased to work. Socializing like this required focal points because these were the areas where it was easiest for the ambulances to congregate.

These interactions, like those at Private Ambulance’s headquarters, gave providers a sense of community despite a work environment that made regular interaction more challenging than in many other workplaces. This sense of community was important for providers because it provided a sense of connection that could be lost during busy shifts when providers are simply “passing in the night” between calls rather than actually seeing each other for any length of time. It also provided a means for developing “occupational communities” (Van Maanen and Barley 1984), which embody the shared meanings and practices of EMS providers. Socializing provided a concrete means for sharing the knowledge, norms, and culture that constituted the world of EMS work.

A Virtual Community

Space, and the lack of interaction inherent in mobile workplaces like EMS, presented a challenge for developing occupational communities, just as bridging space and time presented challenges for institutions in Giddens’ work (1984). Providers were able to bridge these gaps in time and space during the workday, and therefore develop virtual occupational communities, by using ubiquitous smartphones that they carried (as I noted above, every participating provider had one). When interactions were not feasible, either because of call volume or dispatcher
requests to post in specific locations, providers relied on smart phones to stay in touch with each other during shifts.

In particular, two purposes of smartphone use were identified in the observation and interview data. The first purpose was that texting between providers allowed them to facilitate the meet-ups at focal points that were discussed in the previous section.

CP: How do you kind of all end up congregating?

Seth: So we either do preplanning, so we’ll preplan like, oh, you want to do this later? And I’m like, oh yeah, let’s try. Or we get group text messages going, and go to [an ice cream shop] and get coffee and whatever, just kind of see where everyone is.

These group text messages allowed providers to make plans even if they did not cross paths physically with each other. Another provider described a similar process for arranging meet-ups with friends, adding that there was an additional advantage to meeting up with other crews during a shift:

CP: How often do you do that, the texting other crews?

Rachel: Pretty frequently. Especially if it’s like I’m closer to some people than others... But if someone’s on [i.e. working], I’ll be like ‘hey where are you posted’ and if it’s kind of a slow day, we’ll like meet up, you know, down wherever they’re posting and just kind of hang out. Get out of the truck for a bit, socialize with someone else. Because I mean you spend twenty-four hours with the same person, you want to sometimes get out and socialize with someone else.

Meeting up, therefore, was also a relief valve for managing relationships with co-workers, which this provider identified as particularly important when such long periods of time were spent with only one other person in the cramped ambulance cab.

Texting, and using other applications that allow messaging, was not just a means to an end (in terms of arranging meet-ups) but also an end itself. It allowed providers to maintain off-duty relationships with each other and stay in touch during workweeks that could stretch to sixty hours or more:

John: Most of the time, like probably 70-80% of the time it’s non work stuff or just [about] hanging out doing stuff. I mean I’m pretty good friends with a lot of people here so usually hang outside of work, too...I would say, more than not stuff we did, stuff we want to do. Plan stuff.
Interactions that could happen in person in many workplaces, such as arranging plans to spend time together outside of work, could be more easily facilitated via text messages during shifts because not all providers were at work each day and, even if each of the providers in question were at work, the pace of the shift may make planning in person difficult.

The second purpose was that texting also allowed providers to informally share information that was relevant to their jobs. This was sometimes information that was not related to patient care but nonetheless was important to a shift. For example, during the fieldwork phase of data collection, several providers who were participants in this study concocted a “selfie” game that involved various public bathrooms in the City of Chapman. They would send around pictures of themselves in these bathrooms, and then the others would guess where the bathroom was:

Shift 222, Note 5
Sam laughs because he has just received a picture from Harrison of him in a pink bathroom. Sam doesn’t know where he is, but Olivia and Drew tell him that they think Harrison is in a particular ice cream and coffee shop’s bathroom. Sam shows them several other photos, including a picture of Sam in [the deli we are parked out front of]. Olivia had been talking about how she needed to go to the bathroom, but after seeing Sam’s photo (and asking him where the bathroom is) she decides not to use it - "that's disgusting" [she says]. Sam agrees that its not a great bathroom, and points out the "communal soap bar" as evidence.

This game, carried out via messages sent between smart phones, was both an attempt to pass the time and inject humor into shifts. It also served to share knowledge about the quality of bathrooms around the City, which was a topic that providers were invested in because they spent so much of their shifts on the road. Multiple providers reported using these types of messaging apps to share pictures of them during shifts with their co-workers, which allowed the development of shared experiences despite not being in the same physical location.

Providers would also informally share knowledge about patients with each other. Since calls were all dispatched on the same frequency, providers hear when their colleagues are sent out on “jobs”:

Charlie: ...sometimes if we went to an address, maybe we just give them like an unofficial heads up like listen I was there earlier. They’re—maybe they refused or the guy is going to be tough, doesn’t want to go, but he really needs to go. If it’s something pertinent like that, we can kind of
head someone off on the pass. If we know who's on that truck going to that address.

Providers therefore used text messaging in unofficial ways to provide background on patients they recognized and try to facilitate a smoother experience for their co-workers who were treating a known patient. Messaging therefore allowed providers to stay in contact, plan meet-ups, share jokes or entertaining photos, and share information about patients that may help their co-workers through a call.

**Stages, Regions, Stations, and Downtime**

In elaborating his idea of “stations”, space, and time for individuals and institutions, Giddens (1984) relied heavily on Erving Goffman’s theories of social life. Giddens made use, with some critique, of Goffman’s (1959) concepts of “front stage” and “backstage” to describe how different social contexts could be used to place a public persona forward (the “front stage” for Goffman, the “front region” for Giddens) and others could be used to obscure particular behaviors or realities (the “backstage” for Goffman, the “back region” for Giddens).

The four focal points described previously can similarly be divided into “front” and “back” regions (or stages). The two focal points in The Old Quarter - “Eaton Plaza” and “City Park” - could both be described as “front” regions where the providers and their ambulances occupied public spaces in plain view of passersby, residents, and local businesses. The other two focal points, Private Ambulance’s headquarters and the Mather Hospital, could alternatively be understood as “back” regions. Private Ambulance’s headquarters, as noted in CHAPTER 4 (see pp. 84-87), was for the most part obscured from public view. It was set back off a side street and easy to miss without specific directions. The ambulance bay at the Mather Hospital was physically partitioned from Chapman Street by a high concrete wall. Similarly, the bunkroom within the hospital was set back in a corner of the Emergency Department that was physically separate from the patient care spaces within the ED.

A critical insight of Giddens’ was that “back regions are zones within which agents recover forms of autonomy that are compromised or treated in frontal contexts” (1984:127). Giddens’
observation about the “back stage” of life is notable in the context of EMS work and focal points. For example, providers used downtime for sleeping, particularly during long shifts like the Paramedics’ “24s”. As described previously (see this chapter, p. 126 as well as FIGURE 6.9, p. 297), sleeping during downtime was concentrated on a small number of addresses. Providers described a company policy where they were instructed not to sleep in visible locations. When parked in a “front stage” space such as “Eaton Plaza” or “City Park”, providers would climb into the back of the ambulance where they would not be readily visible to passersby. In the Mather Hospital, however, providers routinely slept in the front cab of the ambulance or lounged on the futons and bunk beds in the crew room. So long as they were not called out of the Mather to post, they were free to sleep in ways that were more relaxed than in a “front stage” area of the city.

Spending downtime in “front regions” also opened providers up to interruption. During the field observations, the crew I was riding with spent part of an afternoon in Eaton Plaza. During one ten-minute period, the following exchanges were recorded:

Shift 430, Note 16:
After about five minutes after arriving at [Eaton Plaza], a women walks up to the ambulance and asks directions to an area restaurant. Jason gives her directions (Preston did not know where the restaurant was) but the women still seems confused. After she leaves, Preston asks Jason about where the restaurant is and Jason gives him a description of the building.

After another five minutes, a man walks up to the ambulance and reports that someone who appears drunk is at the foot of the stairs going down in the [Old Quarter] transit station from [Eaton Plaza]. He asks who he is supposed to tell about this, and Jason responds "us". Preston tells me that they (the homeless or substance users) like to hang out down there because it gets slightly less foot traffic than up "here" [Eaton Square]. He says, though, that the [Regional Transit] police are through there "every five minutes" and that if there is a problem they will call. I ask if the walkups to the ambulance occur frequently. Jason says that they do, and Preston adds that its not everyday but regularly. He also adds that "I've never had it not be for a homeless person".

These were two very different types of interruptions, but nonetheless they are interruptions that are far less likely to happen when providers post in “back stage” locations. Providers therefore had to maintain a certain level of availability and professionalism in those “front stage” areas since they were a public presence that was readily identifiable from a block or more away. In
both of these cases, providers served as a sort of public clearing house where they were able to
point a pedestrian towards a restaurant of interest in one case and accept (though not act on) an
individual’s concerns about a homeless person in another. This visible role in Eaton Plaza,
however, was not universally welcomed.

**Contested Spaces in EMS Work**

One distinction between the “front stage” focal points and the “back stage” focal points is that
the “back stage” areas frequented by providers keep them from conflict with residents and
business owners. In comparison, both “front stage” focal points generated controversy during
the study period. Providers’ use of any “front stage” space, focal point or otherwise, were
determined in part by the availability of parking. Providers were sensitive to parking spots and
the amount of time they spend in a giving location. This was particularly true when providers
utilized parking lots for downtime, such as at convenience stores in Uptown or Tory Plaza. Both
of these locations had parking lots that providers would use, though they would be careful not to
occupy more than one spot or to not monopolize a space for an extended period of time. On the
street, there were other rules providers followed to determine whether or not a spot was “fair
game”:

CP: Are there other places where you...can’t go and park?

Charlotte:  We don’t park in handicapped spots...But as far as streets, I
mean as long as we are really adhering to like one-ways, you don’t want to
be going the wrong way down a one-way or something like that...We try to
avoid bus stops. Like all the bus stops along [Main Street]. and
[University Plaza], they don’t want us parking there, which is
understandable. There’s really, most of it’s fair game. Loading zones, if
we’re in the truck, are pretty fair game, too, because we can just move if
someone comes.

Loading zones and other areas designated by the city as “no parking” zones were commonly
used by providers when posting on the street as opposed to in a parking lot. For the first two-
thirds of the shifts I observed (n=13 of 20), providers would frequently park their ambulances in
an area known as Eaton Plaza (see FIGURE 6.13, p. 301).
CHAPTER 6: Hurry Up & Wait

This section describes Eaton Plaza and the conflict over it during the observation phase of data collection in greater detail. In emphasizing this particular conflict, this section highlights both the importance of certain “focal points” for EMS providers and ways that the EMS system as an institution can affect neighborhoods and space. Providers’ use of areas like Eaton Plaza emphasizes a critical aspect of mobile work, which is that the vehicle becomes the office. Their resulting use of certain physical areas of neighborhoods as “office spaces” has the consequence of occupying street spaces that others may view as having a different purpose. These tensions highlight the various ways public space is constructed in urban areas, and the conflicts that can emerge over these spaces.

The Eaton Plaza Conflict

Eaton Plaza was a predominately commercial area located in the Old Quarter. There were numerous stores in a number of different commercial strips including two chain coffee shops, a third local coffee shop, a pizzeria, and a chain Mexican fast food restaurant. There were also various retailers, both local and chain, carrying a variety of types of clothing, footwear, jewelry, and sporting goods. Providers would park their ambulances along a stretch of Eaton Plaza that was marked as a loading zone. This stretch could accommodate two or three ambulances at any one time, and offered easy access to the stores and restaurants in the Plaza. Most importantly, it offered quick access to a store collectively referred to by a nickname - “the Market”. “The Market” was a small grocery store that included a salad bar, a hot bar, sushi, a deli counter offering sandwiches made to order, and a restroom for customers. Over the course of the two-thirds of the shifts I observed during this time period (n=8 of these 13), we visited the market 11 times to buy drinks, snacks, sandwiches, and to use the bathroom. Eaton Plaza and the Market were a frequent presence during this first period of observations, with 21% of the downtime events during these shifts occurring in Eaton Plaza (see TABLE 6.14, p. 302).

However, in the fall, a change occurred. During a shift, the providers mentioned that they were no longer able to park in Eaton Plaza. Though Eaton Plaza had offered a significant degree
of convenience because of the availability of dining establishments, shopping, and “the Market’s” bathrooms, it had also been the site of a running conflict between Private Ambulance, the City Traffic Department, and a particular business in Eaton Plaza. Providers had sometimes been forced to move by Traffic Enforcement officers patrolling the area:

Shift 430, Note 8
After idling for about a half an hour, a [Chapman] Traffic Enforcement officer asked the ambulance to move up to the front of the loading zone (when A6 first got into [Eaton Plaza], there were cars in part of the loading zone; once they left the ambulance was left in the middle and 539 had not moved it). Preston commented that "she kicked us out of here yesterday."

Separately, the owners of a jewelry store had become increasingly vocal in their opposition to Private Ambulance posting its crews in Eaton Plaza:

Shift 48, Note 8
They talk about how Eaton Plaza is no longer an option for parking. There have been incidents with a jewelry storeowner and his wife who have been complaining about the presence of Private’s ambulances across the street from their shop. They have recently become more vocal recently, coming up to ambulances and taking pictures of them parked in a loading zone. They have been calling Private and complaining about this. Things came to a head last week, according to the crews, and they have now been instructed not to park there anymore.

The frustration that this caused providers was evident almost immediately. On a subsequent shift, the crew I was with was directed by their dispatcher to post in the Old Quarter:

Shift 325, Note 8
Dispatch directs us to "head into the [Plaza]" ... When we get into [Eaton Plaza], Pam wants to park [in the loading zone] but 179 says that he doesn’t want to get yelled at by either the jewelry store people or the Chapman Parking attendants. Pam responds "fuck that women and her jewelry store....go in and ask her if she has anything tasteful."

The providers during this shift ultimately parked further up the street from the loading zone, away from the store in question.

Over the course of the final third of the shifts I observed (n=7 of 20), the crews I was with only returned to Eaton Plaza’s loading zone once, and we only patronized “the Market” twice. This drop off, summarized in TABLE 6.14 (see p. 302), meant that providers were pushed out of one the primary locations of the Old Quarter and into more peripheral areas, which often lacked the amenities of Eaton Plaza. One provider described his strategy, saying that “there are other
places..[we can] move up [Eaton Street] towards West [Chapman] or just find different spots until someone else complains". A particular area that saw an increase in traffic was along a City Park on the northern end of the Old Quarter. This post saw a jump in traffic after Private Ambulance stopped parking in Eaton Plaza (see TABLE 6.14, p. 302) - it constituted 7% of all downtime in the Old Quarter area before the change and 28% of all downtime in the area after.

Providers expressed a range of opinions about this change. Some providers were largely ambivalent about it, with one going as far as to say that he understood the business owners’ concerns because “you can’t—can' blame them...I wouldn't want a diesel truck running in front of my business all day”. Other providers were more critical. Idling ambulances, one of the rumored complains that had been leveled at Private Ambulance, served a function for providers. One provider described their working conditions in the following way:

Pam: ...it’s kind of... discouraging because we’re not doing anything malicious. Like I get when people like leave their trucks on and stuff like that, but it stinks because everyone gets air conditioning and heat in their office...you know what I mean, like this is my office. Like I’m sorry you guys don’t like the emissions that I’m producing, but I’m not a truck that’s delivering like a little keychain to your house from Amazon. I’m here with a ton of equipment that’s plugged in. And it’s like sixteen degrees outside or it’s eighty-four degrees outside and it’s a big box, a big metal box like out in the sun. So it’s definitely disheartening that people literally don’t know what we do and what the capacity we do it.

This provider went on to describe the “people” she was referring to as the jewelry storeowners. While providers were generally critical of the overruns themselves, many focused less on the specific conflict with the jewelry storeowner, talking instead about how the change with the loading zone had affected their shifts. One provider noted:

Ben: It's been difficult. Things seem more disjointed. Like I used to be able to go there and talk with crews a lot because that's where everybody would usually be if they were in [University Plaza] and now it's like unless you communicate directly with another truck...like by texting [them] or whatever...it's pretty much like if you run into them you run into them.

Providers also focused on the removal of easy access to bathrooms, restaurants, and entertainment that Eaton Plaza had afforded them:

Harrison: I mean sometimes it wasn’t even like you were working because you could park there, get out of the truck, sit on the bench, have a coffee, watch some guy on stilts do tricks for an hour and a half. And if
you needed to go to the bathroom, it’s right there. Everything was right there. Now we’re kind of like kicked out of there, and it’s not a struggle, but it’s inconvenient to try to have to find food and a bathroom and all this other stuff that I think people don’t really take into consideration when you’re working twenty-four hours inside of a van.

One of the common themes in these quotes was the division providers’ felt between themselves and people who worked in an office. Providers highlighted the aspects of their job that kept them on the streets, working long hours in their ambulances without a base to return to. The specific nature of the conflict in Eaton Plaza should not distract from a broader trend - between leaving the field at the end of the EMS shift observations and returning three months later to conduct the semi-structure interviews, providers were also instructed to avoid the City Park post that had seen a large increase in traffic. Providers reported increased complains about idling engines from residents and others who worked or were frequent users of services in area.

The Social Construction of Place

It is important to note that not all “front stage” areas of the city generated conflict. Providers reported no conflicts with storeowners in North Chapman or Tory Plaza where they would occupy parking spaces at local convenience stores. This difference in the case of EMS downtime represents a larger tension in Giddens’ (1984) work. His abstraction of place focuses heavily on how the actor views a space and, furthermore, spaces themselves are “seen as given or fixed rather than socially constructed and contested” (Urry 1991:172). Perhaps this is because Giddens treats place as an abstraction without dealing with specific contexts or, more importantly, variation among a number of contexts. With Giddens’ work, then, we are left to believe that time and space matter, but not why some spaces may matter more than others or why the same space may mean different things to different agents.

To return to the conflicts over “Eaton Plaza” and “City Park”, the conflicts over the space were, at their most basic, about whether or not it was appropriate for ambulances to use and occupy these areas of the city. In both of these areas (“stations” to Giddens), the priorities of EMS providers differed in important ways from the priorities of other users of the space. For
EMS providers, their priorities were staying warm or cool, which necessitated idling the ambulance’s engine while parked. They also prioritized staying in a central location with numerous amenities for a long period of time. In both cases, outside parities had a different conceptualization of what was appropriate in “Eaton Plaza” and “City Park” and were vocal in protesting what they saw as misuse. EMS providers’ presence did not fit, according to the providers themselves, in with other actors’ conceptualizations of “Eaton Plaza” as a prime, high rent shopping area or “City Park” as a quiet residential corner of the neighborhood.

While Giddens does little to elucidate these tensions, the urban literature generally (Lefebvre 1991; Logan and Molotch 1987) and literature on urban homelessness more specifically offer a language for understanding such sociospatial exclusion. The concepts of “primary” and “marginal” space (DeVerteuil et al. 2009; Stuart 2014) have been typically used to describe differences in how urban space is viewed with respect to use by the homeless. “Prime” spaces are those “that are primarily used and valued by domiciled and ‘mainstream’ society” (Stuart 2014:2), as opposed to “marginal” where homeless individuals are pushed or expelled to (Stuart 2014). The quintessential marginal space, according to Stuart (2014), is the Skid Row neighborhood in Los Angeles. We can adapt this distinction here for EMS providers by defining prime spaces as public arenas that are constructed as commercial or residential spaces where the long-term presence of EMS providers is seen as an unwanted distraction. Marginal spaces, for EMS providers, are those where their presence is not distraction or could otherwise be defined as “backstage” from the providers’ standpoint.

“Eaton Plaza”, for EMS providers, was as quintessential in this regard as Skid Row was (and still is) to the homeless. The sociospatial exclusion of providers from this area impacted providers particularly because the level of amenities available and the ability to socialize were in some ways unparalleled. This was especially true given the need to stay “centralized” and, during the day, dispatcher’s typical instance that providers avoid posting at the Mather Hospital for extended periods of time. Providers were therefore squeezed in a number of directions toward “City Park”, only to have a similar conflict over this space emerge a few months later.
The inevitability of these conflicts for EMS providers is to some extent a product of a number of key differences between EMS, police, and fire services. For police, the weight of their own authority may keep citizens from vocally opposing their presence in particular neighborhoods. Fire fighters, in comparison, have stations (physical ones as opposed to Gidden’s theoretical “stations”) to return to between calls. In many urban EMS systems, EMS providers are not afforded the moral authority like that of law enforcement, and lack the physical infrastructure that fire departments have invested so heavily in. All of these occupations, however, are “blue collar” in nature. In Chapman, the neighborhoods in and around The Old Quarter are decidedly not “blue collar”, with multi-million dollar homes, private schools, boutique shops and restaurants, and exclusive hotels. Providers recognize these differences (see CHAPTER 4, pp. 87-91) in the demographic makeup of the City, and one interpretation of the conflicts over space in Eaton Plaza is that there is class difference between the providers themselves and the businesses and residents that make up much of The Old Quarter’s population.

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Downtime in Emergency Medical Services work is presented here as important for a number of reasons. For the providers themselves, downtime serves as a venue for resting between calls during long shifts. A shift with considerable downtime (though not too much) is one with good “flow” or “pace”, as opposed to shifts where providers are almost constantly engaged in emergency calls. Downtime is also a venue for providers to exert autonomy over their work in ways that responding to emergency calls do not typically afford them. While they cannot control the pace of their shift, the social or clinical nature of their patients, or the time patient care takes, they can control how and, to some extent, where they spend their downtime.

Perlow’s (1999) model of work time helps to contextualize the constraints that are placed on providers’ use on downtime, particularly so when it is extended (see FIGURE 6.3, p. 291) to include the spatial constraints and context that are present in EMS work. Following the lead of
Giddens (1984) and Goffman (1959), the spatial context of EMS work can be seen as both important and varied. Providers utilize “focal points” because they offer a large number of amenities as well as the opportunity to socialize with coworkers rather than, on busy shifts, simply “passing in the night” as they respond to emergency calls. Goffman’s use of “front” and “backstage” as descriptors of how individuals present themselves is a useful metaphor for understanding how focal points may differ in terms of their public and private faces. Public, or “front stage” focal points may engender conflict if EMS providers’ use of them becomes a distraction.

This acknowledgement that different agents socially construct space in different ways is a departure from Giddens, but it offers a means for understanding how conflicts may emerge in “primary” spaces of cities where EMS providers do not fit in with the landscape of the neighborhood. The ways in which space is contested between EMS providers and neighborhood residents mirrors broader tensions within Chapman and other cities about who has the right to use public spaces. These conflicts over space often emerge around the homeless (Stuart 2014; von Mahs 2005). This chapter’s focus on how space is socially constructed with particular actors or agencies in mind provides a conceptual connection between downtime for EMS providers and the complicity of the EMS system in enforcing a similar set of sociospatial exclusions on the homeless, which is described in CHAPTER 8.

More broadly, this chapter emphasizes the importance of space for EMS providers during the two-thirds of their workday when they are not engaged in emergency work. This is not idle or unimportant time, particularly given the interest in space and place in EMS work. The time-geography perspective of a single shift presented earlier in this chapter illustrates the ways in which EMS downtime serves as exposure to place on a regular basis, helping providers form opinions and knowledge of their surroundings even when not engaged in patient care. These sociospatial frames that providers have are the where we turn to next in CHAPTER 7.

Speaking more generally, there is a need for greater sensitivity to space in the sociology of work. Space, as noted in CHAPTER 2 (see p. 39), often lurks in the background of studies - the
importance of the neighborhood diner for copier repairmen (Orr 1996), the wider context of the neighborhoods doormen work in (Bearman 2005), or the travels of insurance salesmen (Leidner 1993). Yet space remains relatively unexamined in each of these studies as a topic in its own right. As workplaces change into less structured, more dynamic environments (much as the nature of the work performed in these places has changed as well), and work is increasingly performed in coffee shop or “innovation spaces”, there is a need to understand how both the spatial as well as the social context of work matter. In the case of EMS providers, where downtime happens alternatively facilitates and constrains the character of downtime. If providers are posted to certain neighborhoods, such as Midtown, the options for bathrooms and restaurants are far more constrained than in other neighborhoods like The Old Quarter. To widen this discussion out to other occupations, work in mobile or non-traditional sites may well impact employees’ ability to get work done or to do work efficiently. Borrowing a contextual focus from urban sociology therefore has much to offer the sociology of work through a focus on the sociospatial context of work itself.
CHAPTER 7: Grunt Work - Provider Perceptions of the Spatial Concentration of Sub-Acute Patients

While CHAPTER 6 dealt with the two-thirds of Emergency Medical Services shifts spent on the wide variety of administrative and personal tasks that constitute “downtime”, this chapter and the following chapter return to a focus on the official work of the EMS system - the provision of emergency medical care. In CHAPTER 5 I demonstrated that both emergency calls themselves and providers’ perceptions of these calls cluster spatially though there is considerable disagreement between these two measures of EMS work. This chapter picks up that line of inquiry in an effort to better understand the confluence of social and spatial factors that influence emergency calls. In doing so, considerable attention is paid to the latent function (Berger 1963; Merton 1957) of the EMS system as an under-appreciated element of the social safety net rather than focusing on the manifest function (Berger 1963; Merton 1957) of the EMS system to respond to critical emergencies.

The chapter begins with the distinction that providers make between “real emergencies” and “bullshit”, a distinction previously used by other health care providers in emergency settings (Roth 1972). Data from the EMS shift observations and the Calls for Service dataset are both presented to illustrate the frequency with which non-acute or sub-acute calls take place in
Chapman City. The frequency of this work is particularly important because it represents a fundamental tension within EMS work. Ironically, the system is set up and providers are trained to handle patients who require immediate medical intervention, and yet these events are relatively rare. This tension is important because it is connected to providers’ assessments of the moral worthiness of patients (Roth 1972), frames that may influence how providers respond to patients who they deem as less needy or deserving (Roth 1972; Timmermans 1999).

Using five categories of patients identified first during the EMS shift observation phase of data collection and further explored during the semi-structured interviews, the second part of this chapter explores the meaning providers attach to patients who are not acutely ill. This section also examines spatial data that describes the degree to which providers perceive these patients to be located in particular areas of Chapman. Importantly, demographic characteristics and objective measures of the incidents of these patients do not provide full explanations for the ways in which providers’ perceptions are spatially rooted. These spatial data also provide an explanation for the discord presented in CHAPTER 5 (see pp. 102-105) between provider perceptions of the volume of their work and the more “objective” measure.

Providers’ strong conceptions of the frequency and spatial concentration of “shit work” are part of a broader interest in “dirty work” (Hughes 1951) or “shit work” (Emerson and Pollner 1976) within medical sociology and the sociology of work, where it has been used to describe work in mental and behavioral health settings (e.g. Emerson and Pollner 1976) as well as certain occupations like nursing (e.g. Allen 2001). Providers’ perceptions are also part of a growing interest within urban sociology on the ways in which individuals produce and reproduce neighborhood stigmas and reputations (Besbris et al. 2015), a process Jones and Jackson (2011) refer to as “discursive redlining”. These strong, shared conceptions of the spatial concentration form the basis for the next, and final, substantive chapter of the dissertation (see CHAPTER 8), which focuses on the ways in which multiple stigmas intersect for form providers’ stigmatized views of a particular neighborhood in Chapman.
Data and Analyses

This chapter focuses on providers’ perceptions of five types of calls that were originally identified during the EMS shift observations and were explored further during the semi-structured interviews (see CHAPTER 3, pp. 59-61). The types of calls were: (1) calls for the homeless, (2) calls for substance use, (3) calls for psychiatric issues, (4) calls for non-acute issues, and (5) calls for chronic illnesses. Definitions for each of these call types are included in TABLE 7.1 (see p. 303). These calls are discussed using both qualitative data from the semi-structured interviews as well as spatial data gleaned from the sketch map exercise (see CHAPTER 3, pp. 59-61). Providers’ focus on these distributions is important because of their relationship with providers’ perceptions of “bullshit” work.

To test the impact of this relationship, a dependent variable was constructed based on the nine category categorical measure that was mapped using a bivariate choropleth map in CHAPTER 5 (see pp. 102-105 and FIGURE 5.10, p. 285). The categories represented areas where providers’ views showed both agreement and disagreement with the objective measure. For areas of disagreement, the degree of disagreement was subdivided into six categories (three levels of provider overemphasis and three levels of provider under-emphasis). For analyses purposes in this chapter, these nine categories were collapsed initially into a three-level ordinal variable where areas of provider under-emphasis, agreement, and provider overemphasis were distinguished. A binary measure representing provider overemphasis was then created and used as the dependent variable for the logistic regression analyses presented at the end of this chapter. This variable has a value of “1” for any Census Block Group that was identified as “overemphasized” (i.e. colored a shade of blue) in FIGURE 5.10 (see p. 285). It was regressed on the independent variables described in CHAPTER 3 (see pp. 62-63) to control for the actual distribution of calls as well as demographic trends and two scales described later in this chapter (see pp. 166-169; descriptive statistics for these variables are found in TABLE 7.2, p. 304). Three final models were fit:

- Model 1 - logistic regression of provider overestimates on the perception scale
• Model 2 – logistic regression of provider overestimates on the perception scale while controlling for the actual distribution of calls
• Model 3 – logistic regression of provider overestimates on the perception scale while controlling for the actual distribution of calls and demographic variation

Model fit was assessed using the Hosmer-Lemeshow Chi2 goodness-of-fit, McFadden’s Pseudo R2, the Akaike Information Criterion (AIC), and the Bayesian Information Criterion (BIC).

"Real" and "Bullshit" Calls

Roth (1972) offered a typology of binary constructions emergency department (ED) providers used in her research for ‘morally evaluating’ their patients: deserving versus undeserving and legitimate versus illegitimate (Lincoln 2006). These constructions were used by ED staff to inform their treatment decisions for patients. What was most striking in Roth’s work was the degree to which ED providers were found to overestimate the volume of patients who were seen as undeserving and illegitimate. Staff members would routinely offer assessments, according to Roth, in the 70% to 90% range for inappropriate use while Roth’s independent assessment indicated that only perhaps 20% to 25% were not appropriate patients for the ED (Roth 1972:849-850).

EMS providers at Private Ambulance engaged in a similar evaluation process of their patients. As one provider noted during the interviews, “I would say, honestly, 95% of my day is dealing with a bunch of bullshit and maybe the other 5% is dealing with actual medical emergencies with people”. Though other providers did not always engage in such colorful descriptions of their patients, there was an undercurrent throughout many of the interviews where particular groups of patients, such as the homeless or those using alcohol or other drugs, were seen as less deserving of care. A different paramedic stated during his interview that these types of patients were “not sick like in the medical terminology. They might have an illness...say alcoholism, or whatever, but it’s not the same”. Another provider noted that their coworkers had a tendency of looking at patients and saying “they’re not sick, they’re just drunk”. While this can certainly be true – being drunk is not necessarily a medical problem – it hints at a wider view within EMS that minimizes substance use as an issue. The context within which providers
commented about ‘just being drunk’ was focused on chronic alcohol users, as opposed to an individual who had one or two too many drinks at a party or a bar.

These types of generalizations speak to a broader discrepancy within EMS work where the manifest function (Berger 1963; Merton 1957) of the system to respond to acute medical emergencies did resonate with providers when they thought about the patients they treated and how sick they may be. When providers spoke about “good shifts” and “good patients”, they referred to two distinct but overlapping constructs. “Good shifts” could be quiet Sunday shifts where providers get a nap in, a shift that had a “good” flow of calls and downtime, or a shift with “good patients”. When providers talked about “good patients” or “good calls”, they talked about trauma patients and medical patients who required significant intervention. As this quote shows, it was easy for discussions of “good shifts”, “good calls”, and “good patients” to bleed together:

1 CP: How would you describe a good shift?

Ed: ...the best shift that I’ve had here was like three months ago, right before I got my paramedic, and I had two really serious traumas in one shift. Which for [Chapman] is pretty rare, because there’s not a whole lot of high speed roads...but I got two really good traumas. I had a really, really sick patient who was septic and needed a whole lot of interventions. I [also] had a really drastic heart attack that day that we were able to solve. And then a bunch of just a couple other, pretty interesting, I mean not like too serious, but hypoglycemic patients that actually needed interventions, not just a little juice and here you go, like unconscious.

This paramedic’s descriptions of what types of patients constituted “good” calls provided a useful point of comparison to others’ descriptions of “bullshit” work. There was a subtly implied hierarchy to this provider’s views of “good” calls - “really serious traumas” were at the top along with a patient with a massive infection (sepsis). Below those patients were those that were “pretty interesting” but “not too serious”, such as a patient with low blood sugar (hypoglycemia) that needs interventions. This paramedic also compared his diabetic patient to a hypothetical, 

1 One interesting point about providers’ discussions of “calls” and “patients” was the way in which these were discussed as interchangeable constructs. For EMS providers, the typical interaction with patient was limited to the duration of the call. Thus, while patients have longer ‘illness careers’ that health care providers observe, EMS providers do not always get to see these careers over their duration.
less serious patient with diabetes who only needed some juice to raise their blood sugar as opposed to a more medicalized intervention. Another provider made a similar comparison, differentiating between a “real emergency”, which was a patient who had dropped a heavy object on their foot and crushed the bones, from the patient “who’s eyelash is in their eye and they want to go to [a top teaching hospital] and they want to see a specialist”.

Though patient-level data was not included in this analysis, data collected during and after the EMS observation phase (see CHAPTER 3, page 56-59) do give some insight into the various levels of acuity seen by providers. When coding field notes from the EMS observation phase, I used a simple metric to assess patient acuity. When providers administered only Basic Life Support interventions the call was coded “Green”, when some level of Advanced Life Support care such as routine cardiac monitoring were administered the call was coded as “Yellow”, and when providers indicated there was an acute life-threat to the patient the call was coded as “Red”. Though simplistic, this metric did reveal a general trend (see TABLE 7.3, p. 305) - the overwhelming amount of work providers engaged in was either providing only Basic Life Support interventions or a low level of Advanced Life Support monitoring. In only six cases did providers indicate that the patient was acutely ill or injured.

The Emergency Medical Dispatch data within the calls for service dataset (see CHAPTER 3, pp. 62-63) provides another lens through which to view acuity within an urban EMS system. EMD data were coded into one of six levels by dispatchers that range from the least acute, known as “Omega” calls, to the most acute, which are known as “Echo” calls (see TABLE 7.4, p. 306; see also APPENDIX E, pp. 376-379). These data, which were pooled from 2011 to 2013, indicated that approximately two-thirds of calls in the dataset were considered Basic Life Support calls (i.e. Omega, Alpha, or Bravo level calls) at the time of dispatch. This was roughly equivalent to the observed number of calls during the EMS field observation phase of data collection (see CHAPTER 3, pp. 56-59).

Taken together, these measurements of acuity from both the EMS shift observations and the calls for service dataset suggest that there is some merit to providers’ perceptions that EMS
work is not defined by responding to critical patients but rather other types of patients, which some providers characterize as “bullshit”. In both measures, nearly two-thirds of either did not require (in the EMS shift observations) or were not anticipated to require (in the calls for service data) anything beyond Basic Life Support interventions. Such a conceptualization of EMS work defies the typical image that policy documents (e.g. IOM 2007a) paint of the EMS system when they talk about the EMS system as a “21st century trauma system” (IOM 2007a). Rather, EMS work as it is experienced is about managing ‘everyday health and social crises’ that do not pose immediate threats to life. This work forms the basis of my argument that the EMS system is less a 21st century trauma system than a mobile arm of the social safety net in the United States.

**Spatial Distribution of Sub-Acute EMS Work**

In analyzing the field notes from the EMS shift observation phase of data collection, a number of emergent categories were identified that broadly encompassed the types of work that providers characterize, if not as “bullshit”, then as not serious or otherwise incongruent with the EMS system’s formal mandate. These categories stood out because of the degree to which they depart from this formal mandate to respond to serious and acute medical needs. The five categories are summarized in TABLE 7.1 (see p. 303). Four of the five categories, excluding homelessness, are medical conditions. Homelessness is the outlier in this respect because it is not a medical condition in and of itself, but rather a social issue. Furthermore, there is often significant overlap between these five categories among the patients treated by Private Ambulance - the co-occurrence of homelessness and substance use, for example, or the overlap of substance use and chronic alcoholism. Nevertheless, these categories appeared from the field notes to define the brackets that bounded the sorts of non-acute and sub-acute types of calls that

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2 This distinction is generally made by mental and behavioral health clinicians who label homelessness as an “Axis IV” diagnosis – an environmental or psychosocial issue that presents further challenges for an individual above and beyond their existing mental (Axes I and II) and physical health (Axis 4) diagnoses.
construed so much of each shift I observed. These five categories are therefore best described not as clinical categories but as overlapping patient populations.

During the interviews, providers were asked to identify on their sketch map the areas (if any) that these calls were more likely to occur in. They were also asked about their experiences responding to these calls and what reasons they had for explaining the concentrations of these calls that they perceived. This section describes each of these types of calls in turn and then analyzes the spatial meaning that providers attach to these calls.

**Calls for the Homeless**

The homeless in Chapman were hard to ignore for EMS providers during the shifts that were observed as part of the EMS shift observation phase of data collection (see CHAPTER 3, pp. 56-59). During downtime in Eaton Plaza, providers would frequently see homeless individuals passing through the area or panhandling on the corner in front of the “the Market”. Drives through Midtown Plaza, which were a regular feature of downtime during shifts, likewise brought EMS providers into visual contact with individuals who appeared to them (or were known to them) to be homeless. Field notes from each shift contain regular references to the homeless both during downtime and during calls.

One challenge for understanding these calls, however, is that providers work from an incomplete understanding of their patients’ clinical and social histories. As I have noted previously, EMS providers differ from their colleagues in an Emergency Department since EMS providers may have a better sense of the social and spatial context a patient is found in. This is countered, however, by incomplete knowledge of a patient’s medical history, which may be documented in hospital medical record systems that ED providers have access to. Thus providers may be unaware of a patient’s “status” as a homeless individual or past history of housing instability. Data from the field observations suggests that EMS providers may know patients from previous (and sometimes frequent) interactions, but this again can be an
incomplete knowledge base. EMS providers may then rely on visual cues to infer homelessness (such as unkempt hair, dirty clothes, or strong body odor), which can also be problematic.

A second challenge for understanding EMS provider and system interactions with individuals who have various degrees of housing instability is that homelessness is fundamentally a social, not clinical, condition. Though there is a common assumption that homelessness and mental illness are co-occurring conditions (Fischer and Breaky 1991), medical sociologists and anthropologists have long argued that the burden of mental illness among homeless individuals is overstated (Snow et al. 1986; Mathieu 1993; Lyon-Callo 2000). Yet interactions between homeless individuals and the EMS system are medicalized even before providers arrive on-scene. The very dispatch of an ambulance implies some medical need, with 9-1-1 dispatchers or other first responders on-scene making a conscious decision to request an ambulance.

During the field observation phase of data collection, most of the incidents in which providers believed or knew the patient to be homeless did involve some degree of medical need. The most prominent of these issues was substance use, particularly the consumption of alcohol. Providers reported that a locally produced, cheap vodka was the primary form of alcohol abused, but that they also saw patients drinking other forms of hard liquor, mouthwash, hand sanitizer, and vanilla extract. Patients were transported to hospitals if they could not “ambulate” (walk) after consuming alcohol. If they could walk, patients were either left on the street if they did not want to go to the hospital or the providers would arrange transportation for them to a shelter. Providers also described treating patients for exposure to the elements, including hypothermia and frostbite during the winter months. These were particularly pressing concerns for patients who were living on the street instead of inside shelters. During the coldest part of the EMS shift observation phase of data collection, the shelters exhausted their overflow capacity and providers ended up transporting patients to the ED simply because there was no other option for getting them into a warm space for the night.
Providers described treating chronic health issues that were “accrued because of their lifestyle”, as one provider put it. These issues included diabetes, neurological issues including seizure disorders, and chronic cardiac issues. Providers also believed that many of their interactions with patients were not the result of a clinical need but rather were the result of a patient’s desire to get a meal or a few hours indoors at the hospital. One provider described walking up to a bench with six homeless individuals sitting on it, noting that it could be difficult to determine which individual they had been called for since “they all want a turkey sandwich or a place to sleep”. These regular interactions with patients that providers believed to be homeless were described as “grunt work” by one provider.

Finally, as the example of transporting patients simply to get them into a warm space during the winter illustrates, there were instances where providers interacted with homeless individuals when there was not a clear, present clinical need. Callers to 9-1-1 who reported an individual sleeping in public or on their property would generate a response by Private Ambulance. More often than not, these interactions did not result in providers rendering care. However, on several occasions, including the previous example involving being outdoors on a cold night and an instance where an individual was found sleeping in public after being warned to move to a more discrete location, individuals were transported despite the lack of a clear clinical motivation for doing so. This subset of interactions with the homeless, though they are not strictly clinical, fit with a wider pattern of medicalizing homelessness (Snow et al. 1986; Mathieu 1993; Lyon-Callo 2000) and deviance (Conrad and Schneider 1980; Conrad 1992).

Despite focusing on cases where there was no or little clinical need for patients who were homeless, some providers acknowledged that patients could be quite sick. One provider stated during their interview that “sometimes they can be very sick, they can, you know, they’ll go to the hospital, they’ll be admitted for weeks”. Some providers also acknowledged that there were homeless shelters that they rarely visited for calls or groups of patients who were homeless that they saw infrequently:

Jeffrey: ...they’re dry shelters, and people actually, they’re there, they probably have jobs. I think once in a while you go there for a sick patient,
like a diabetic or if someone has chest pain or whatever...and I’m sure there are other shelters around that you never go to because they have a good infrastructure that they maintain the problems. And if they need to go to the hospital, they’ll either take them or they’ll call 9-1-1, but it’s a medical call.

The emphasis this provider places on “other” or “dry” shelters as opposed to the “wet shelter” is important, because it underscores the dominant discourse about homelessness among providers. “Dry” shelters refer to those that offer temporary shelter to individuals who are sober, while “wet” shelters fit a harm reduction model that prioritizes getting individuals inside over making sure they are sober (Inciardi and Harrison 2000; Tsemberis, Gulcur, and Nakae 2004). “Wet” shelters therefore have a lower barrier of entry and allow any individuals to use their services regardless of their current or past substance use issues. The association of homelessness with the “wet shelter” in providers’ discussions underscores Private Ambulance’s focus on a particular subset of the homeless population that engaged in substance use. By extension, these patients were often lumped into a category of having “nothing wrong” or being “bullshit calls” because of their status as consumers of the “wet” shelter’s services.

The association between homelessness and substance use was often emphasized through providers’ labeling of individuals using the term “1-37D”. This term was used both for patients as well as individuals that providers would drive past on the street who appeared homeless. The phrase was used routinely during the EMS shift observations and appears regularly in the semi-structured interview transcripts as well. Providers’ understandings of the precise meaning of the term “1-37D” could be nebulous. Over dinner during Shift “99” (see CHAPTER 6, pp. 116-117), the conversation focused on homelessness for a period of time and included discussion about the label “1-37D”:

Shift 099, Note 25:
We walk back towards the ambulance from the restaurant and Nora says that we can sit outside if I want. I say sure, and we pick a table in the plaza near the ambulance... We talk about the homeless a little bit and she mentions the [1-37D] label for patients - I ask her if she knows where the code [1-37D] comes from when an ambulance is dispatched to one. She says that she doesn’t know.
This quote underscores the general ambivalence providers held towards the actual definition of “1-37D”. During both the interviews and the observations, it became clear that few providers were completely aware of the full meaning of “1-37D” but that it nevertheless held a common colloquial meaning among the paramedics and EMTs. During the interviews, if providers mentioned the “1-37D” label, I asked them to define it:

Pam: [1-37]... it is...I think it’s the police code for an intoxicated person. So ... then we use it all the time, so [1-37].

Seth: A [1-37] is a homeless person in the City of [Chapman]. A “1-37D” is a homeless alcoholic I think is how they define it.

Again, this displays the fuzziness that providers have about the precise definitions. After all, an intoxicated person (as in Pam’s definition) could be anyone from a college student celebrating the end of another week of classes, a young professional out on the town, a chronic alcoholic, or a homeless person with a substance use disorder. More commonly, however, providers identified “1-37D as having some official meaning for patients who were both homeless and alcoholics (as in 497’s definition). In reality, the term is derived from the section and part of the State public health law that pertains to the treatment and rehabilitation of patients with alcohol use disorders. Ironically then, Pam’s definition was closer to the “truth” than the commonly held definition used by Seth and others. Nevertheless, the label “1-37D” had taken on an alternative meaning whereby, in the common parlance of EMS providers, firefighters, and police officers in Chapman, a “1-37D” was a patient who was both homeless and an alcoholic. EMS providers labeling of patients may have long-term consequences both at later stages of a patient’s treatment trajectory as well as in subsequent interactions with EMS providers who have prior knowledge of a patient.

**Substance Use Calls**

Providers’ perceptions about the co-occurrence of homelessness and substance use were also reflected in their responses to questions about substance use itself. These conversations returned frequently to providers’ perceptions of “homeless drunks” or “Alcoholic...just people
who live on the streets”. The label “1-37D” appeared frequently in providers’ responses to interview questions about substance use more generally, as do discussions of the “wet shelter” where individuals who are homeless and who have substance use disorders can stay at night. Despite this tendency to return to the homeless as a singular category, providers did acknowledge seeing other types of substance use on a regular basis. In particular, there was near unanimous support for the sentiment that “the big one...is there's alcohol...without a doubt the largest [type of] substance abuse that we see”. This was the substance providers reported seeing most often for both the homeless population in Chapman as well as two other groups of patients. As noted previously, the type of alcohol used regularly included beer, liquor, and various other substances that contained alcohol but were not marketed as alcoholic beverages such as mouthwash, hand sanitizer, and vanilla extract.

One group of patients observed during the fieldwork and discussed by providers was college students. Chapman, being a “college town” with multiple universities, generated a share of calls related to drinking at parties. Providers were regularly called to college dorms, off campus apartments, and to areas with bars in the city for young people who were intoxicated. These occurred with particular frequency on weekends: “I would say [that we see] a lot of ETOH college students on weekend nights” acknowledged a Paramedic, who added that these calls were for situations where “Brittany can’t hold her liquor”. Other Paramedics admonished students during interviews for “not knowing how to drink”. These calls were occasionally serious, with one call observed during the shift observation phase generated a rapid response for a student who fell several stories off a fire escape at a party. More often, however, they were seen as routine by providers where containing the patient’s vomit from contaminating the ambulance was the biggest priority.

A second group of patients treated for substance use were individuals who were intoxicated, though they did not fit into the categories of “homeless” or “college student”. During the observation phase, these included patients who had drank too much at bars or were involved in car accidents. Other patients were treated who were known to providers as chronic alcohol users
but who had some form of stable housing. During the EMS shift observation phase of data collection, these calls occurred most often in public housing or privately operated complexes that contained large numbers of Section 8 recipients. These types of patients were seen with less frequency - in the case of the car accident, only one accident where alcohol use may have been a factor was observed, and the patient transported by the crew I was with was the passenger. These types of calls were not discussed with any frequency during the interviews, but they do represent a variation of substance use calls that were distinct from other types of calls observed.

A third, distinct group of patients treated for substance use were opioid users. During the EMS shift observation phase of data collection, an increase in opioid overdoses was widely reported in both local and national media (Seelye 2013; Turkewitz 2013), though providers varied in their assessments of the frequency of these patients. Some questioned whether heroin had reached the “epidemic” proportions reported in the media. Nevertheless, nearly all providers described treating patients for opioid overdoses (either heroin, some combination of methadone or suboxone, or prescription opioids). One of the distinct features of opioid overdoses in the pre-hospital setting is that providers have an intervention at their disposal called Narcan, which has the effect of “waking up” patients who have overdosed on heroin or another opioid:

Paul: So I mean if you’re a heroin addict and you just overdosed on heroin, and I give you Narcan to wake you up, I’m not going to be mad that I had to come to this call, and say that’s [not] my job. I’m going to transfer you to the hospital, same way I would somebody that called for chest pain. You got chest pain, okay, you’re going to go to the hospital. [However] I might roll my eyes, and get frustrated inside...

The availability of a distinct intervention that could rapidly change a patient’s status made these calls more comparable, for this provider, to calls for chest pain or another medical issue. Calls for acute alcohol intoxication, in contrast, required little to no intervention. However, even the greater clinical sophistication did not stop this provider from having the same ‘eye rolling’ or “frustrated” response to these patients. Thus, while opioid overdoses were distinct clinically and etiologically from other types of substance use calls, they elicited the same type of frustrations that providers reported with alcohol intoxication. The line between “good” and “bad” calls, then,
was not clearly delineated by clinical sophistication. In other words, having a pharmacological tool for addressing a patient’s symptoms did not clearly trump other biases providers held regarding substance use and behavioral health issues.

An additional layer of complexity with substance use calls was that many of them involved additional comorbid injuries or illnesses. In some of the calls observed during the EMS shift observations, the patients had comorbid traumatic injuries and substance use. In addition to the student who fell several stories from a fire escape, a patient with dark stains on their pants that were initially assumed to be urine was actually bleeding from a puncture wound on their thigh. Other patients were treated for injuries secondary to assaults, including a patient struck in the face with a glass bottle during an argument. Still other patients had chronic illnesses that were the primary reason for seeking care, such as complications from diabetes, along with what providers suspected was active substance use. Substance use calls, therefore, could be complex without being serious, and the chief complaint of the call could be for a different issue altogether.

"Psych" Calls

Providers responded to three types of “psych calls”, as they typically refer to them, during the fieldwork phase of data collection. There were (1) calls for suicide attempts or suicidal ideations, (2) calls for patients experiencing symptoms of their mental illness such as hallucinations or manic behavior, and (3) calls for transfers of patients from emergency departments to psychiatric facilities. The range of mental illnesses that providers described responding to during the semi-structured interview phase of data collection was equally broad, covering schizophrenia, bi-polar disorder, depression, and other illnesses such as eating disorders. While it is certainly possible that there may be subtle patterns for particular types of mental illness within Chapman, EMS providers at Private Ambulance did not appear particularly sensitive to differentiating between types of “psych calls” in regular conversation.
All of the above types of calls and illnesses thus were reduced to “psych calls” or worse (such as “whack jobs”) for practical purposes.

One factor that may explain the way in which providers gloss over the variations in mental illness in conversation is the way “psych calls” unfold. The dispatch information passed to providers is based on the Medical Dispatch Priority System (MPDS; see APPENDIX E, pp. 376-379). The MPDS card (a set of standardized questions used by 9-1-1 operators) for psychiatric issues is Card 25, which is further subdivided into ten categories that represent various conditions (see TABLE 7.5, p. 307). The MPDS approach to psychiatric issues can be broadly understood as a “suicidal/non-suicidal” binary, which the emphasis placed on determining the extent to which a suicide attempt has caused injury to the patient. Providers mirrored this binary distinction during the interviews, focusing extensively in their discussions of “psych calls” on whether the patient represented a threat to themselves or to the providers.

Any patient who is not suicidal but is experiencing a psychiatric crisis would be most likely to be coded as 25-A-1 (“Non-suicidal and alert”) or 25-B-6 (“Unknown status/other codes not applicable”; see TABLE 7.5, p. 307), which are the two codes that are not explicitly linked with suicide. The lack of specificity in these codes belies the complex nature of psychiatric crises. These two codes are also both Basic Life Support (BLS) codes – one at the ‘Alpha’ level and one at the ‘Bravo’ level. Providers’ descriptions of “good calls” or “real emergencies” tend to focus on calls at the upper end of the acuity spectrum (such as the crushed foot one provider described in this chapter’s earlier section on “Real” and “Bullshit” Calls). The MPDS system, by denuding psychiatric crises of their specificity and placing them on the BLS end of the acuity spectrum, constructs psychiatric calls as less emergent.

There are certainly valid reasons for this arrangement. On the psychiatric calls observed during the EMS shift observation phase of data collection, providers did little besides move the patient to the “cot” (i.e. stretcher) and record a few basic pieces of demographic information such as the patient’s name. Coding psychiatric calls as BLS therefore reflects the limited clinical sophistication with which EMS providers approach these calls. From a resources management
standpoint, then, treating these as BLS calls may make sense since no Advanced Life Support skills are typically required for “psych calls” when the patient is not otherwise ill or injured. This raises a final point for “psych calls” – as with substance use, there were a number of calls for other illnesses or injuries where patients had a known psychiatric history or communicated as much to providers during their care. This is a perpetual challenge for providers, who as with substance use and homelessness, often treat patients without access to details of their clinical or social history.

**Calls for Chronic & Non-Acute Conditions**

In addition to focusing on homelessness, substance use, and “psych calls”, the interviews explored two categories of calls that seemed in the EMS shift observation data to broadly described many of the calls that were observed. One group of calls was for “non-acute calls”, which were calls like “lift assists” where providers responded to help patients off the floor when they could not lift themselves as well as other calls where the medical need was described by providers as limited. In some cases, these were calls where patients had been directed by their doctor or another party to go to the Emergency Department. One elderly patient, who was transported for post-operative complications, told the paramedics I was with that shift that she simply “preferred to take an ambulance over a taxi” despite her physician’s request that she take a taxi to the hospital. When discussing “non-acute calls” during the semi-structured interviews, providers would mention things like “minor injuries”, “the flu symptoms”, “nausea or vomiting”, “abdominal pain”, “general weakness”, “diarrhea”, “nosebleeds”, “a paper cut”, and “drunks”.

The second group of calls was for “chronic illnesses”, which was inspired by a number of calls for illnesses such as various cancers, that generated responses during the EMS shift observations. One shift in particular stood out for a string of calls related to brain cancer that occurred one after another during the morning and early afternoon. None of the calls were treated as particularly serious by providers; indeed, two of them did not result in transport to the hospital for the patient. While most shifts did not have such a condensed string of a
particular type of chronic illness calls, these types of issues were present on every shift observed during the EMS shift observations. Providers' conceptions of the “chronic illnesses” category during the semi-structured interviews were equally broad, covering a range of cardiac and respiratory illnesses, diabetes, cancers, chronic substance use, and psychiatric illnesses.

The Spatial Concentration of Sub-Acute EMS Work

In addition to discussing their views of these five types of calls, providers were asked to identify areas in the city where they believed they saw these types of calls on a regular basis. These sketch map data (see CHAPTER 3, pp. 59-61) were analyzed using both thematic choropleth maps (see FIGURE 7.6, p. 308) as well as the Getis-Ord GI* (see FIGURE 7.7, p. 309) and Moran’s I spatial statistics (see TABLE 7.8, p. 310; see CHAPTER 3, pp. 68-70 for details on these techniques). Providers’ views about the spatial distribution of this work could therefore be viewed in a number of ways to better understand the degree to which these concepts are, and are not, spatially rooted. Data for the overall “frequency” measure (see CHAPTER 5, pp. 101-12 for a description of this variable) were also included for comparison.

Providers’ perceptions of the spatial distribution of homelessness and substance use shared a number of the same characteristics. The highest frequencies of attribution for both variables (see FIGURE 7.6, p. 308) could be seen in the Midtown area (where there is a cluster of Block Groups shaded dark purple) and in the Old Quarter (the cluster of Block Groups with a lighter shade of purple visible to the north of Midtown). This endorsement was widespread, with every provider identifying at least one cluster for each of those concepts (see TABLE 7.8, p. 310). The Getis-Ord GI* analyses of these distributions (see FIGURE 7.7, p. 309) both find that the Midtown clusters for both distributions represent “hotspots” of higher than average values. Those hotspots extend into the southern reaches of the Old Quarter neighborhood in both cases.

One important qualification for the substance use variable in particular was the ways in which different populations were clustered spatially. In discussion the Midtown cluster, providers focused on the calls they responded to there for individuals who were both homeless
and who were being treated for substance use. While providers acknowledged that they also treated similar patients in The Old Quarter, they focused more on the college student patient population in that neighborhood during their discussions of substance use. The other group of patients treated for alcohol intoxication, was patients could not easily be identified as either “homeless” or “college students”, were not discussed during the sketch map section of the interview.

A second important qualification for the substance use variable was that providers’ spatial perceptions of opioid use were distinct from their perceptions of the distribution of alcohol use calls. The area seen in FIGURE 7.6 (see p. 308) to the right (east) of Midtown with slightly higher levels of endorsement is the East Chapman area, which a number of providers identified as having higher concentrations of opioid use calls. Other providers, however, were less certain about whether these calls occurred with particular frequency in any one part of the city, with some noting that they felt that these types of calls happened in a wide range of neighborhoods. This neighborhood, however, did not appear in the “hotspot” identified by the Getis-Ord GI* test (see FIGURE 7.7, p. 309). The statistically significant cluster of higher values appeared to the west of East Chapman in the area around Midtown.

Unlike providers’ perceptions of calls for patients who were homeless or for substance use, providers’ perceptions about the spatial distribution of “psych calls” were less definitive - overall, far fewer clusters of “psych calls” were identified by providers than for homelessness or substance use (see TABLE 7.8, p. 310). The sample was split on the degree to which “psych calls” occurred more frequently in particular parts of the city with 43% of providers not identifying any clusters of “psych calls”. As one provider observed: “there’s a bunch of whack jobs in [Chapman]...it’s all over the city”. This provider did not identify any specific clusters on their sketch map for psychiatric patients. Another provided concurred, stating that psychiatric calls were “pretty scattered throughout the city, because mental health is something that doesn’t discriminate, and has no boundaries... and I can honestly say I’ve probably gone to every neighborhood and taken a psychiatric patient”. Providers’ unwillingness to identify areas that
were perceived “hotspots” was therefore not a function of limited contact with patients that had mental health issues, but rather a perception that these calls occurred throughout the city.

The other 57% of providers interviewed did identify at least one cluster where they believed they frequently saw “psych calls”. These clusters covered a wider swath of the City, with only North and West Chapman exempt from identification in at least one cluster. Those providers who did identify clusters repeated the pattern of focusing on The Old Quarter and Midtown, with these two neighborhoods having the highest frequencies of endorsement by providers. In particular, providers described the homeless population in the Midtown area and at the “wet shelter” frequently as having psychiatric issues. This association in particular is important for understanding providers’ perceptions of where psychiatric calls were located within Chapman. One Paramedic stated during the interview that “I think a lot of the homeless people that live in [Midtown Plaza] have some sort of mental health disorder, whether it be addiction or a lot of them do have things like schizophrenia”. Another provide gave a similar response that also illustrates the frustrations that these calls can bring:

Paul: I know [Midtown Plaza] and the shelter and stuff, they’re saying they want to kill themselves, they want somewhere to stay, they want meds, they want to get out of the shelter for the night, something...It’s a pain in the ass, I might roll my eyes, but it’s if they’re going to the hospital, I can’t say no to them, whatever.

The emphasis in both of these quotes on Midtown is reflected in the Getis-Ord GI* analysis of providers’ perceptions of where “psych calls” occur, which identified a “hotspot” of higher than average, statistically significant values in the Midtown area.

Providers’ views of where “psych calls” take place were bifurcated into two groups – those who believed that “psych calls”, and therefore mental illness, could happen anywhere in the city, and those who believed that mental illness happened more frequently among individuals who were homeless and spending time in Midtown in particular. These two views were mutually exclusive, but they did indicate that different populations define “psych calls” for different providers. For over half the sample, the face of “psych calls” were homeless individuals, whereas
the remaining providers did not identify a particular population for whom there was an automatic association with mental illness.

The spatial distributions for the final two types of calls examined, “non-acute calls” and calls for “chronic illnesses”, each received less overall endorsement than “psych calls”. As with “psych calls”, many providers were quick to associate these calls as occurring “all over” the city of Chapman. For half of the providers who participated in the semi-structured interview phase of data collection, this was the predominate perception of these types of calls. A similar bifurcation occurred therefore in the sample between those who did not see any particular spatial variation and those who did identify some areas where these types of calls occurred more frequently.

Among the providers who did identify “hotspots” for these calls, there were two common trends in their descriptions of these clusters. One was a continuation of the Midtown focus, with providers noting that the homeless population in Midtown often had many of the types of “non-acute” and chronic illnesses noted above. This perception likely influenced the results of the Getis-Ord GI* analyses (see FIGURE 7.7, p. 309) for both of these distributions, which both showed statistically significant, higher than average clusters in the Midtown area of the city. The second notable pattern in responses was to associate these types of calls with low-income housing or the elderly and disabled public housing provided by the city. These were complexes that I observed responses to regularly during the EMS shift observations, and providers talked about these as one of the key types of places that they responded to on a regular basis. These complexes are found primarily in three particular parts of the city: Midtown, East Chapman, and North Chapman. Additional complexes are scattered through the city, but the complexes in these neighborhoods have the largest high-rise complexes found in the city.

These data underscore an important point about the views providers’ hold of their work. This responses to patients reflect social perceptions that are frequently imbued with spatial meaning. Their views of patients therefore reflect sociospaital knowledge that associates where patients are found with the types of clinical and social providers anticipate in particular neighborhoods. Rather than being isolated in an emergency department largely devoid of cues
about a patient’s social status and where they live, EMS providers have regular access to that spatial information. This spatial knowledge is reflected in the sketch map data that is summarized in FIGURE 7.6 (see p. 308). The perceptions that providers have of where their work occurs, particularly “shit work” or “grunt work”, therefore becomes particular important because it is linked to broader conceptions of how providers assess the worth and deservingness of the patients that they treat. The data in FIGURE 7.6 (see p. 308), as well as the spatial statistics in FIGURE 7.7 (see p. 309), and TABLE 7.8 (see p. 310), all illustrate strong clustering. Even more importantly, the clustering observed in in each of these distributions appears to significantly overlap. Thus there appears to be not only shared perceptions within each of these categories, but a sense that there is a wider shared phenomena of “grunt work” that these sketch map data capture. The degree to which these distributions are shared, and the explanatory power that these perceptions have for how providers view the overall distribution of their work, is assessed in remaining part of this chapter.

**Shared Perceptions and Misconceptions**

The previous section discussed providers’ shared understandings of their work within particular categories, such as the agreement between providers about the spatial distribution of their work with homeless individuals or people with mental illnesses. This section takes these data and discusses the degree to which these individual perceptions of particular types of work represent a larger, shared perception of “shit work” or “grunt work” by analyzing the relationships between these perceptions. After describing the statistical evidence for such agreement, two alternate explanations for this shared spatial construction of EMS work are explored: (1) that providers’ perceptions reflect demographic trends and (2) that providers’ perceptions reflect the actual incidence of these types of calls. Finally, the shared spatial perceptions that providers have about patients are analyzed for their explanatory power in the discord noted in CHAPTER 5 (see pp. 102-105) between provider perceptions and the frequency of their work in particular parts of Chapman.
Measuring Shared Perceptions

The distributions of the five call phenomena described in the previous section are compared in FIGURE 7.6 (see p. 308). Similarly, the Getis-Ord GI* analyses of these six distributions are compared in FIGURE 7.7 (see p. 309). The two comparisons, show in a format known as small multiples (Tufte 1990), visually display a number of common trends among provider perceptions about where their work occurs. Across five of the six measures (excluding Non-Acute Calls), there are higher levels of endorsement in two noticeable clusters. The most noticeable is the area around Midtown, with dark purple shading on the frequency calls, homelessness, and substance use distributions and lighter purple shading on the psychiatric calls and chronic illness calls distributions. The other noticeable area, with less overall endorsement, is the area of clustering that is visible to the north of Midtown in the Old Quarter area of Chapman.

The visual inspections of the distributions and their corresponding Getis-Ord GI* analyses do not, of course, show statistical relationships between the distributions themselves. One way to assess the interrelationship between these phenomena is through correlation analysis. Given the non-parametric nature of each of these variables (see APPENDIX B for assessments of normality), Spearman’s \( \rho \) values were calculated for each pair of phenomena (see TABLE 7.9, p. 311). The resulting correlations, all of which were statistically significant \( (p < .001) \), show the strongest relationships between calls for homelessness, substance use, and psychiatric calls. More moderate relationships were found between these types of calls and the other two categories - non-acute calls and chronic illnesses. These findings make sense in the context of the interview data, which suggest that far more types of patients fit into the “non-acute” and “chronic” call categories than the other three types of calls. Providers’ responses to the prompts that generated these spatial data therefore suggest that they reflect fundamentally different aspects of their jobs than the measures of homelessness, substance use, and psychiatric calls. Importantly, the qualitative data presented in the previous section underscores the shared
notion providers have that these types of issues are often co-morbid for patients, and that together they form the conceptual core of “grunt work” for providers at Private Ambulance.

Based on the results of these data, a scale variable representing providers’ perceptions was constructed (see TABLE 7.10, p. 312) focusing on the three variables for homelessness, substance use, and psychiatric calls. The resulting Cronbach’s $\alpha$ ($\alpha = 0.9190$) indicates a strong interrelationship among the three variables included in the scale. When mapped (see FIGURE 7.11, p. 313), a similar overall pattern to the individual distributions in FIGURE 7.7 (see p. 309) emerges - the highest values are seen in the Midtown area of the city. A Getis-Ord GI* analysis of these data confirms the higher than average values present in a visible “hotspot” over the Midtown area (see FIGURE 7.12, p. 314). These correlation, Cronbach’s $\alpha$, and Getis-Ord GI* results together form the empirical justification for suggesting that the “Midtown effect” is not just a visual trick but rather a central frame for how EMS providers view their work. This “Midtown effect” can be seen as an EMS equivalent to discursive redlining (Jones and Jackson 2011), whereby health care providers designate certain neighborhoods for particular attention and treatment. In this case, providers overwhelming emphasis on “Midtown” in these data represents an important lens for how EMS providers perceive the work that they do.

Comparing Perceptions and Call Distributions

One possible explanation of these distributions is that they are driven by the actual call volume in different parts of the City. To test this, six types of incidents present in the Calls for Service dataset were selected for comparison. The selection of these incident types was driven by interview data where providers indicated that the dispatch information that they typically received for each of the five sub-acute call types. In addition to the Emergency Medical Dispatch categories given in TABLE 7.13 (see p. 315), providers also described being dispatched for the “1-37D” or for the “unwanted person”, which are both Chapman Police Department incident types. Though correlations were calculated between all of the provider perception and incident type variables, TABLE 7.13 (see p. 315) highlights particular comparisons where providers’
interview responses suggest that comparisons may be particularly salient. In addition, overall counts of low-acuity calls as determined by the Medical Priority Dispatch System determinant levels are also included for comparison with providers’ perceptions.

The general picture that these comparisons show is that provider impressions for these specific types of incidents are moderately to strongly correlated with objective measures of where these incidents take place. Their perceptions are more closely linked with call data for homelessness and substance use than any of the other categories. In particular, the sketch map data on homelessness and substance use calls are strongly correlated with three incident types that providers described in the semi-structured interviews - the “1-37D”, the “unwanted person”, and the “man down”. There were also moderate correlations between these same two provider perceptions measures and the distribution of EMS calls for “unconscious” patients. These relationships are also those where data from the interview suggest a link between how providers describe these calls and the dispatch information they report receiving.

For psychiatric calls, the relationship between the “Psych/Suicide” incident type and provider perceptions of where they respond to these types of calls is a moderate one. Instead, the strongest correlates for provider perceptions of “psych calls” are measures that are strongly associated with where homeless and substance use calls take place. This provides yet another indication that providers’ conceptions of “psych calls” are influenced by the perceived co-occurrence of homelessness and mental illness. The final two categories, “non-acute” calls and calls for “chronic illnesses” have weak to moderate relationships with the given incident types. Interestingly, some of the strongest of these correlations are again between the “non-acute” and “chronic illness” variables and measures of incident types that providers indicated reflected calls for the homeless.

Overall, the strength of covariation between the given incident types and the measures of provider perceptions of their work appears to vary greatly. The distributions of provider perceptions that every respondent reported data for, those for homelessness and substance use, are also the distributions most closely linked to the incident types from the Calls for Service
dataset. The provider perceptions measures that received weaker overall spatial endorsement, those for “psych calls”, “non-acute” calls, and calls for “chronic illnesses”, had relatively weaker relationships with the given incident types. These could be driven by the lack of specificity in both the subjective and objective measures of these types of calls. However, the relatively stronger correlations between each of the five types of suggests that providers views of all five types of “shit” or “grunt” work may be influenced by their work with the homeless.

Based on these analyses, provider perceptions of where certain types of work take place do appear to be related to objective measures of that work. However, the parallels between the subjective and objective assessments of “shit” or “grunt” work are not perfect. Rather, there is some variation in provider perceptions that is unaccounted for by the objective measures. In CHAPTER 5, evidence was presented showing a similar pattern between overall subjective and objective measures of EMS work (see pp. 102-105) - there were areas of substantial agreement between providers’ perceptions of their work and the objective measures, but also areas where providers both underestimated and overestimated that work. The same appears to be true here - providers’ perceptions of “shit” or “grunt” do reflect, to a degree, where this work takes places, with an important caveat that the overlap is not complete and varies substantially between different facets of this work.

**Demographics and Provider Perceptions**

If the actual distribution of calls does not explain providers’ focus on Midtown, it is possible that the “Midtown effect” is the product of providers’ responses to demographic profiles of particular parts of the city, such as the racial, ethnic, or socioeconomic composition of Census Block Groups. TABLE 7.14 (see p. 316) illustrates the Spearman’s rho correlation coefficients for four key demographic variables representing race (count of non-white residents), ethnicity (count of Latino residents), poverty (count of households below the Federal poverty line), and per capita income. There are separate literatures on the impact that each of these has on both individual and population health, and providers are routinely exposed to the material conditions
of their patient’s lives - they see the inside of their homes, for example. Providers described some of this knowledge during interviews when they identified parts of the city (particularly West Chapman) as wealthier neighborhoods and other parts as poorer neighborhoods.

The correlations show weak, positive relationships between the racial and ethnic makeup of Block Groups and the frequency with which providers’ label those Block Groups for homelessness, substance use, and psychiatric calls. The count of households below the Federal poverty rate had pair of weak, positive relationships with providers’ perceptions of substance use and chronic illness calls. There is also an across the board finding of a negative relationship between per-capita income and provider perceptions - the lower the per capita income, the more likely providers were to identify areas of the city during the sketch mapping exercise. These data paint a mixed picture about the impact that demographics have on EMS workers’ perceptions. Providers’ perceptions do follow demographic patterns in intuitive ways, though they do so weakly. These perceptions focus on non-white, poorer areas of Chapman having greater perceived frequency of calls, particularly for substance use, homelessness, and psychiatric reasons. However, the weakness of the relationship suggests that demographics are not the defining force shaping providers’ perceptions.

One reason for the weakness of these relationships is that Chapman is a relatively integrated city (see CHAPTER 4, p. 76). Unlike larger cities that have long legacies of racial residential segregation that have resulted in more clearly defined “black” or “white” neighborhoods, Chapman’s neighborhoods are far more integrated. Recent gentrification has also led to greater socioeconomic diversity. The absence of typical “ghetto” areas within the city may be one reason why providers make few links between their work and patients’ race, and why the connections between providers’ perceptions and demographic trends are weak at best.

Understanding Discord: Provider Overestimation of Call Volume

One consequence of this overarching “Midtown effect” and providers’ emphasis on “shit” or “grunt” work is that it may be the driving force behind providers’ overall assessments of the
work that they do. Their emphasis on the spatial distribution of this work does not appear to fully overlap with either demographic trends or objective measures of their work with the homeless, patients who are substance users, and patients who have mental illnesses. This section describes the logistic regressions analyses that are used to assess the following hypothesis:

H1: EMS providers’ overstatement of their work in certain Census Block Groups is affected by their association of these Block Groups with “grunt” work.

The focus on overstatement is driven by the bivariate map presented in CHAPTER 5 (see pp. 102-105, see also FIGURE 5.10 on p. 285), which showed that providers tended to overstate the call volume in both Midtown and the Old Quarter. Since so many of the distributions illustrated in FIGURES 7.6 (see p. 308) and 7.7 (see p. 309) show a similar focus on these two neighborhoods, overemphasis is focused on here.

To assess this hypothesis, three models were fit (TABLE 7.16, see p. 318; see this chapter’s ‘Data and Analyses’ Section, pp. 146-147) using a dependent variable where “1” indicated that providers overstated the actual call volume of the Census Block Group and “0” indicated that they did not. In the first of the three models, the provider perceptions scale (see this chapter’s ‘Measuring Shared Perceptions’ Section, pp. 166-167) was the sole independent variable included. Model 2 includes both the provider perceptions scale as well as a second scale, the “call scale,” created from the objective measures of the volume of calls for “shit” or “grunt” work. The final model includes a number of demographic controls. All of the individual variables included in the scales as well as the demographic controls are summarized in TABLE 7.2 (see p. 304). The scale variables are detailed in TABLES 7.10 (see p. 312) and 7.15 (see p. 317).

In each of the three models, the provider perceptions scale increases the odds of overestimating the call volume in a particular Census Block Group. The effect of providers’ perceptions of “grunt work” is magnified by the inclusion of the “call scale”. This change in the odds ratio between Models 1 and 2 illustrates the power of the “call scale” as a suppressing
variable. The effect of the “call scale” beyond being a suppressor is in the opposite direction from the main independent variable of interest, the provider perceptions scale. Provider overstatement of overall call volume, then, is not found in these models to be due to underlying patterns of specific types of calls. In other words, Census Block Groups where providers overestimate call volume are not simply Block Groups that have higher volumes of “grunt work”. Rather, it is providers’ own skewed perceptions of the spatial distribution of “grunt work” that are driving their overstatement of call volume. Importantly, these findings are independent of demographic variation. These demographic controls were not only found to be insignificant predictors of overestimation, but also decreased the overall model fit.

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The logistic regression model presented in the previous section represents the culmination of a number of important pieces of evidence presented thus far - the discord between provider impressions of their work and objective measures in CHAPTER 5, their overarching focus on “shit” or “grunt work” presented in the first part of this chapter, and the inability of demographic or specific call patterns to account for providers’ spatial perceptions. The model underscores the power that provider perceptions for particular types of patients, independent of objective measures of this work, have on shaping the overall impressions that they have of EMS

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3 Model’s 2 and 3 both illustrate the power of the “Call Scale” as a suppressor. The scale meets the classical definition of a suppressing variable (Horst 1941; see also Friedman and Wall 2005) because the scale (1) is not correlated with the dependent variable but (2) is correlated with the provider perceptions scale. Horst’s (1941) third criteria is that the inclusion of the suppressing variable should increase the amount of variance explained (typically measured as $R^2$), which is an appropriate criteria for linear models. In the logistic regression models, there are numerous measures that approximate certain characteristics of the classic $R^2$ measure (see Menard 2000; Mittlbock and Schemper 1996). Two are provided in TABLE 7.14 - McFadden’s Adjusted $R^2$ and Tjur’s $D$. Of these, Tjur’s $D$ has the most similarity with the classic $R^2$ statistic (Tjur 2009). In both measures, the inclusion of the “Call Scale” does increase the amount of “variance” explained based on the increases observed in both McFadden’s Adjusted $R^2$ and Tjur’s $D$, fulfilling Horst’s (1941) third and final criteria for a suppressing variable. The scale has an ancillary benefit of also greatly improving model fit, which the AIC and BIC statistics included in TABLE 7.14 illustrate.
work in Chapman. These impressions double the odds of overstating the call volume for a particular Census Block Group. These findings are in line with Sampson’s (2012) finding that subjective impressions of particular social phenomena are better predictors than objective measures, though the outcomes of interest differ substantially from Sampson’s work.

Taken together, these findings illustrate the ways in which particular facets of work that providers view as undesirable shape the views that they take of their jobs as a whole. Even more interestingly, these perceptions shape the ways in which they view neighborhoods. Though provider impressions of particular patient groups are moderately to strongly associated with the call volumes for these types of patients, providers apply their spatial perceptions more widely, causing them to overstate the call volume in certain areas. This represents a “spatial illusion” that is produced by interactions between providers and certain types of patients. These interactions come to define a wider swath of a neighborhood, just as specific characteristics of these patients come to define the patient group as a whole. This discord is termed the “clinician’s illusion” (Cohen and Cohen 1984) in other settings, and the findings of this chapter suggest that EMS providers’ illusions are not only influenced by generalizations about patients but also by spatial generations of where these patients are located.

This “spatial illusion” is represented in Chapman by what I termed the “Midtown effect” earlier in this chapter. Providers’ emphasis on Midtown was evident throughout the EMS shift observation and semi-structured interview phases of data collection. This represents a health care equivalent of “discursive redlining” (Jones and Jackson 2011). The empirical evidence that providers’ focus on “Midtown” and on certain types of “bullshit” work there lays the foundation for the fourth and final substantive chapter, which takes a closer look at the Midtown neighborhood in an attempt to understand why providers’ perceptions of their work are so dramatically affected by the patients they see in this neighborhood.
CHAPTER 8: Midtown - The Intersection of Disorder, Stigma, Place, and the EMS System

The perceptions providers’ hold about their jobs, particularly elements of their work that they disparage as “bullshit”, were seen in CHAPTER 7 as factors that cause them to overestimate the amount of work they do in particular neighborhoods. In particular, perceptions of homelessness, substance use, and psychiatric issues are seen as co-occurring phenomena. In CHAPTER 5, the bivariate map (see FIGURE 5.10, p. 285) identified two primary areas where providers overstated the volume of calls - the Old Quarter and Midtown. The overstatement of calls in Midtown is particularly important given the strong, shared perceptions providers’ hold about their work. These perceptions center on Midtown, where five measures of “grunt work” presented in CHAPTER 7 all have higher-than-average, statistically significant clusters. In CHAPTER 7, this phenomenon was termed the “Midtown effect”. This chapter takes a closer look at EMS work in Midtown, beginning with a discussion of Midtown’s borders and social geography that is informed by providers’ own perceptions of the neighborhood along with additional evidence of providers’ focus on this particular part of Chapman.

The core of the chapter makes three intertwined arguments about Midtown’s prominence in the eyes of EMS providers. First, I argue that EMS providers’ focus on Midtown is the result of a
subset of Chapman’s homeless population that providers believe have co-morbid mental and behavioral health issues. This perceived co-morbidity explains the strong association seen in CHAPTER 7 between perceived frequency of homelessness, substance use, and “psych calls” and the “1-37D” incident type found in the calls for service dataset. This small group of patients is particularly notable because they are labeled as “frequent fliers” by providers - patients that Private Ambulance employees see with great regularity during their workdays.

Second, I place providers’ perceptions of these patients within a broader discussion of the stigma of homelessness, mental illness, and substance use. Calls for these issues are seen not only as “grunt work” because they violate a shared construction of EMS work as focused on critical emergencies, but also because they focus on routinely stigmatized patient populations. The strong, shared focus providers have on these patients illustrates the ways in which institutional stigmas emerge and are embraced by an occupational community that is deeply frustrated by its work with patients providers believe have co-morbid mental, behavioral, and social issues. Even more importantly for this project’s aims, these shared views are spatially rooted. Providers’ assumptions about the “Midtown homeless” therefore become intertwined with the neighborhood itself, illustrating the ways multiple stigmas intersect to contribute to an overarching neighborhood stigma (Besbris et al. 2015).

Finally, I explore two consequences of these intersecting stigmas of illnesses, patients, and place. The first is the role EMS providers’ play in enforcing an informal spatial exclusion, where the ambulance system plays a part in removing homeless individuals from Midtown. Midtown is constructed as a “primary space” (DeVerteuil et al. 2009; Stuart 2014) where homelessness is tolerated in limited ways, as opposed to other “marginal” areas of Chapman where there is more patience for homelessness. In this regard, there are parallels to the ways EMS providers found themselves excluded from certain areas of Chapman as described in CHAPTER 6. The second consequence of note is “getting burned”, when providers write-off a patient’s symptoms as caused by substance use, mental illness, or sheer manipulative behavior. When providers “get burned”, they ignore these symptoms when in fact they are signs that a patient is seriously ill.
“Getting burned” is viewed in this chapter as a consequence of over-exposure to “frequent fliers” and the intersectional stigmas associated with substance use, homelessness, and the Midtown neighborhood.

**Data and Analyses**

The data in this chapter are drawn from two sources: the bulk of the chapter relies on qualitative data from both the EMS shift observation field notes (see CHAPTER 3, pp. 56-59) as well as the semi-structured interview transcripts (see CHAPTER 3, pp. 59-61). These data were coded both for emergent themes using inductive codes that describe discussions or examples of particular types of calls (e.g. “substance use”) or patients (e.g. the “homeless”). The quotes used throughout this chapter were selected not only because they were coded with these inductive codes, but also because they were part of quotes focused on the “Midtown” neighborhood. These were identified using deductive spatial codes described in CHAPTER 3 (pp. 65-66).

In addition, several other data sources are utilized in specific sections of the chapter. The initial section on Midtown’s boundaries and “social geography” utilize data from all six of the semi-structured interview’s sketch map prompts that dealt with emergency call responses (see CHAPTER 3, pp. 59-61 for more details). These data were used to identify clusters that providers indicated were located in the Midtown neighborhood. These data were augmented by qualitative data collected during the neighborhood observations (see CHAPTER 3, p. 56).

Finally, the variables used in the previous chapter’s logistic regression models were reanalyzed here with an alternative hypothesis. In this chapter, models were fit to understand the role that Midtown played in variation of the provider perceptions scale (see CHAPTER 7, pp. 166-167 as well as TABLE 7.10, p. 312). These models were fit using the same set of demographic and call volume controls used in the logistic regression models in CHAPTER 7 (see pp. 146-157 as well as TABLE 7.2, p. 304). Three final models were fit:

- Model 1 - OLS regression of provider perceptions on Midtown
- Model 2 - OLS regression of provider perceptions on Midtown controlling for the actual distribution of calls
Model 3 - OLS regression of provider perceptions on Midtown controlling for the actual distribution of calls and demographic variation

Model fit was assessed using the link test, the Akaike Information Criterion (AIC), and the Bayesian Information Criterion (BIC).

Midtown

Before addressing neighborhood stigma, I will lay out a means for determining the boundaries of the Midtown neighborhood from sketch map data collected during the semi-structured interview phase of data collection. I then use this neighborhood boundary definition to bound an ethnographic description of the neighborhood itself, focusing on the “social geography” (Smith et al. 2010) of the Midtown neighborhood by focusing on both the physical layout of the neighborhood as well as a number of locations that are socially important for the discussion of homelessness and substance use in Midtown. Finally in this initial section I lay out evidence that provider views about substance use, homelessness, and other forms of “bullshit” or “grunt” work are focused specifically on the Midtown neighborhood.

Defining the Midtown Neighborhood

Given the differences between providers’ definitions of neighborhoods and the “official” neighborhoods as defined by the city of Chapman, described in CHAPTER 4, it is perhaps unsurprising that the neighborhood that is so central to providers’ conceptualizations of their work is not one Chapman’s official neighborhoods. It was therefore necessary to construct a definition of the neighborhood for analytical purposes. To do so, I analyzed data from the sketch map exercise for agreement among providers. If a provider described a cluster as being located in “Midtown” (n=147 clusters out of 537, or 27.4%), it was included in this analysis. The percentage of providers who included each Census Block Group in a “Midtown” cluster was then calculated and mapped. These percentages were then mapped, the results of which can be seen in FIGURE 8.1 (p. 319).
The results underscore the wide view that providers can take of particular neighborhoods, with much of central and southwest Chapman included by at least one provider in clusters labeled as “Midtown”. There is, however, a cluster of stronger agreement that centers around ten Census Block Groups where at least half of providers identified a cluster in that Block Group has being in “Midtown”. The boundaries of this fifty percent line are used in the subsequent chapter as the analytical border for the “Midtown” neighborhood (see emphasized area in FIGURE 8.1, p. 319). This definition straddles a number of administrative boundaries as opposed to being limited by these definitions. It cuts across multiple Census Tracts and encompasses the ten Census Block Groups that comprise this emergent definition of the Midtown neighborhood. It also straddles parts of four “official” neighborhoods in Chapman (see CHAPTER 4, pp. 74-82 for more details on neighborhoods).

This approach to neighborhood definitions differs from much of the neighborhood effects literature. While it is fundamentally rooted in the U.S. Census Bureau’s geographical definitions, the focus here is on piecing those together in a way that better approximates individuals’ conceptions of neighborhood boundaries. Since it retains a widely used spatial language, this approach allows administrative data to be integrated into analyses in ways that would not be possible for definitions that rely strictly on individual perceptions of boundaries. However, this approach does not assume the one-to-one relationship between Census Tracts or even zip codes and “neighborhoods” as much of the quantitative neighborhood effects literature does. This middle-of-the-road approach to neighborhood definitions is particularly important for mixed methods applications where matching perceptual data from respondents and administrative or spatial data is desirable.

**Midtown’s Social Geography**

The Midtown neighborhood in Chapman (see FIGURE 8.2, p. 320) is centered at its northern end around Midtown Plaza, which is a sparse, concrete public area at a major street intersection where Main Street and West Street - the two major thoroughfares that bisect the
neighborhood - come together. In FIGURE 8.2, this area is located on the southwest corner of the intersection and is highlighted in red. The plaza stretches a city block in width. Part of the plaza doubles as a waiting area for busses that are part of the regional transit system. At the left end of the plaza (in relation to FIGURE 8.2) is a small corner store and a sandwich shop. This end of the plaza is narrower, about ten feet in depth, without benches or other amenities. The wider part of the plaza (the right end in relation to FIGURE 8.2) widens to about fifty feet. This part of the plaza is adorned with benches around several large concrete planters that have trees planted in them.

During the daylight hours of the multiple days I visited Midtown as part of the neighborhood observation phase of data collection (see CHAPTER 3, p. 56), these benches fill with individuals sitting, smoking cigarettes, and talking to each other. Some drink out of paper bags, and some are seen sleeping on the benches. Just to the south of the plaza, on the same side of Main Street, is a large chain drug store. As one walks south along Main Street past the drug store, there are several retail stores including a chain coffee shop and a liquor store. A second liquor store sits across Main Street and slightly further south. The sidewalks here are often filled with trash, including discarded liquor bottles - mostly “nips” - small, single serving liquor bottles. During one visit to Midtown, I watched men engaging in “hand-to-hand” sales in front of the chain drug store where cash was quickly exchanged for individual liquor bottles.

The main plaza was the primary focus of providers’ attention during downtime, when we would cruise through the major intersection and providers would look for individuals that they knew from past calls. However, the main plaza was only one of several locations that are particularly important for discussions of homelessness and substance use in Midtown. Across West Street sit additional wooden park benches. Down West Street to the left (in relation to FIGURE 8.2, see p. 320) are two park-like areas, one on each side of the street, that have benches and a small amount of green space. Near these parks are two social service facilities that provide services, including needle exchange and other harm reduction services to both the
homeless in Chapman as well as individuals with substance use issues. All of these locations are within a block’s radius to the north and west of Midtown Plaza.

Outside of the plaza, the neighborhood unfolds from either side of Main Street, which bisects the Midtown neighborhood from north to south. For much of its length, Main Street is lined with five and six story structures, most of which have retail establishments, restaurants, or bars on the first floor and then a mix of commercial and residential units on the upper floors (labeled in brown in FIGURE 8.2, see p. 320). Along this strip are additional services and businesses that cater to a wide range of low income residents as well as the homeless, including several “dry” shelters, a check cashing business, and a used clothing store.

This strip of Main Street has had a long reputation for being a bohemian neighborhood within Chapman, replete with bars offering live music as well as several larger music venues, vegetarian restaurants. It has also been known for a degree of tolerance towards homelessness and substance use.¹ Both of these characteristics have been noted in the local media and lamented by city politicians and neighborhood groups seeking to “clean up” Midtown. One recent local media article about the Midtown neighborhood interviewed a longtime local business owner who described the neighborhood’s past reputation for drug sales and sex work.

Recent reports made public by the Chapman Police Department² describe Midtown as one of several key areas for the homeless population in Chapman. One report, which corresponded with the timing of the EMS shift observation phase of data collection (see CHAPTER 3, pp. 56-59), described Midtown as “gritty” and notes that the homeless individuals who frequent the area are “more hardened”. The report described the population as consisting primarily of older

¹ Specific references are not included here to preserve the confidentiality of the research site. City planning documents for the Midtown area, as well as local media accounts, both contain references to the neighborhood’s overall emphasis on arts and culture (the bohemian aspect) as well as longstanding concerns that local residents and business owners have voiced about the volume of homeless individuals in the area. Local media reports also describe both past and recent large-scale efforts by the Chapman Police Department to target drug dealing in the neighborhood.

² As before, citations are not provided for these documents to preserve the confidentiality of the research site.
individuals who have been homeless for a long period of time and who have a history of both incarceration and alcohol use issues.

This report suggests that some of Midtown’s former grit remains despite significant changes in recent years. These have occurred primarily across the southern swath of Midtown, which has seen considerable development. One Paramedic noted during his interview that:

Tim: ...Midtown Plaza has changed a lot, actually. It's much cleaner and safer now. Midtown Plaza was way more dangerous ten or twenty years ago...twenty...I’d say ten or twenty years ago. It’s kind of...and it’s changed a lot. [Technology] companies have come into Downtown Plaza. It's a huge amount of money so that’s changed a lot. There used to be a lot of vacant dirt lots in Midtown Plaza and Downtown Plaza and that doesn't exist anymore.

Those vacant lots, the site of old factories and business lost to the neighborhood during the 1960s and the 1970s have been rebuilt as the knowledge economy within the City of Chapman has expanded. This southern part of Midtown (labeled in green in FIGURE 8.2, see p. 320) is now home to science firms and technology startups where iron works and factories once stood.

Outside of these two commercially focused areas, to both the east and west, are residential zones (labeled in blue in FIGURE 8.2, see p. 320). They are particularly dense, especially in the blocks just west of Main Street. These blocks include numerous apartment buildings and a high rise building operated by the City of Chapman that is open to individuals receiving social security retirement or disability payments. Further west and east from Main Street, the apartment blocks give way to densely situated multifamily homes, many of which are two-and-a-half or three story homes that have been subdivided into apartments. There is little commercial activity in these parts of the neighborhood save for the occasional corner store.

Providers’ Perceptions and Midtown

The provider perception data discussed in CHAPTER 7, based on the sketch map exercise done during the semi-structured interview phase of data collection (see CHAPTER 3, pp. 59-61), were described as illustrating a “Midtown effect” because of the results of the Getis-Ord GI* analyses that showed statistically significant “hotspots” in the area of Midtown. FIGURE 8.3
(see p. 321) illustrates the ways in which the sketch map frequencies from CHAPTER 7 (see pp. 161-165 as well as FIGURE 7.6, p. 308) occur in Midtown by highlighting the Midtown boundaries using the definition described earlier in this chapter. FIGURE 8.4 (see p. 322) illustrates the Getis-Ord GI* results from CHAPTER 7 (see pp. 161-165 as well as FIGURE 7.7, p. 309) by similarly highlighting the overlap between those test results and the boundary definition described previously. Together, these two figures illustrate the focus given to Midtown during the sketch mapping exercise by providers. In the areas that providers have the strongest agreement as constituting “Midtown”, there is also strong focus on these call phenomena.

Another way of viewing the “Midtown effect” is with a regression analysis where the provider perceptions scale described in CHAPTER 7 (see p. 167) is regressed on a binary measure representing the Midtown neighborhood as well as the other control variables from CHAPTER 7 (see TABLE 7.2, p. 302). All of these measures as well as the three models are summarized in this chapter’s ‘Data and Analyses’ section. The results of the regression analysis (see TABLE 8.5, p. 323) suggest that the variable representing Census Block Groups within the Midtown neighborhood explains a large proportion of the variance in the provider perceptions scale. Some of this variance is explained away in Model 2 with the addition of the call scale, indicating that as in CHAPTER 7 there is evidence that at least some of the variation in providers’ perceptions can be understood as a response to actual call volume. However, it should be noted again that the “Midtown effect” in these models exists independently of the call scale, suggesting that perceptions of actual call volume are not the sole factor influence providers’ own perceptions of their work.

Model 3, like the third model presented in CHAPTER 7 (see pp. 171-172), shows a limited impact of demographic factors on provider perceptions. In this case, only the measure of the number of individuals below the federal poverty line in each Census Block Group is statistically significant, showing a negative relationship between poverty and the provider perceptions scale. A unit increase in the poverty count is associated with an 0.015 unit decrease in the emphasis providers place on a particular Census Block Group as measured by the perceptions scale.
It should be noted that there are a number of statistical limitations in this regression analysis. Shapiro-Wilk tests (Shapiro and Wilk 1965; see also Royston 1982; Razali and Wah 2011) of the residuals for the models indicate that they are not normally distributed. Additionally, the Breusch-Pagan test indicates that variance of the residuals is not equal to zero. All three of the models were fit using robust standard errors as a check against both the non-normal and heteroscedastic residuals. Additionally, the results of the linktest and the Ramsey Regression Equation Specification Error Test (RESET) test in Stata indicate that there are model specification issues these regression models (Stock and Watson 2003).

Despite these limitations, the results are consistent with the other data described previously that indicate a large degree of focus by providers on the Midtown neighborhood. Taken together, there are two important conclusions from this section as well as the data presented in CHAPTER 7. The first is that Midtown occupies a significant (in both the real world and statistical senses) position in providers’ perceptions of their work. The second is that this focus on Midtown cannot be explained as simply a reflection of either the overall call volume or call volumes for specific groups of patients such as homeless individuals or patients who use alcohol or drugs. The next section of this chapter discusses this second point and offers several reasons why providers focus on Midtown despite the wider incidence of homelessness, substance use, and psychiatric issues throughout much of Chapman.

The Multiple Stigmas of Patients, Illness, and Place

The previous section provided both a description of the Midtown neighborhood and additional empirical evidence in support of the idea that there is a “Midtown effect” in how providers view their work. These complimentary pieces of data leave two major questions to be addressed: why do providers focus on Midtown despite evidence that the issues providers perceive Midtown to symbolize - homelessness, substance use, and mental illness - are more widespread, and what are the consequences of this focus. This next section addresses the question of why by paying particular attention to the subset of patients who are found in
Midtown on a regular basis, whom providers refer to as “frequent fliers”. The term is widely used in health care circles to describe patients who use emergency departments and other services on a regular basis (Hackenschmidt 2003; Malone 1995; Millard 2007), so it is unsurprising that this label is applied to patients in EMS settings as well. What is particularly important, however, are the ways that so-called frequent flier patients fit providers’ stigmatized perceptions of substance use and homelessness. The perception that these patients are found overwhelmingly in Midtown forms the basis for providers’ overall assessments of the neighborhood and the development of a neighborhood stigma above and beyond the stigmas of mental health, substance use, and homelessness.

"Frequent Fliers"

Though providers may interact with homeless individuals in a wide variety of settings, they are seeing certain patients on a regular basis, and these more frequent interactions with individuals are by providers with associated with Midtown. One provider put it succinctly - “the patients that we normally see a lot [in Midtown] are…the homeless frequent fliers”. The use of the label “frequent fliers” is common within health care settings, particularly in emergency settings. It is just one of a number of labels used by emergency department staff to describe patients who are routine users of emergency services (Hackenschmidt 2003; Millard 2007). One study of emergency nursing went as far as to note that patients are seen so frequently that they are almost like family to the nurses treating them (Malone 1996).

Frequent fliers in the context of Midtown and the use of Private Ambulance’s services are patients who are seen several times a week or even a shift by providers. Like the nurses in Malone’s study (1996), providers get to know intimate details about these patients:

John: Other than that, sometimes we kind of have fun. We'll drive through [Midtown Plaza] spotting people we know....normal customers...

CP: Who are the normal customers?

John: Uhh...just like the 1-37’s. 1-37’s would be like normal customers. Pretty much the one you see like once a shift. You know walk through the hospital [and] somebody else you work with is bringing them in. You're
like ‘ugh, you again’. You like walk through and you’re like ‘uhhh I know you, your name, your social security number’. Where you sleep at night kind of thing. You know all that.

The familiarity that John describes, where he knows the individual’s personal details and daily routine, comports with Malone’s (1996) finding that “frequent fliers” become as well known to health care providers as family in some sense. Yet the experience for EMS providers is distinct in that there is a constant level of exposure to these patients that goes beyond regular instances where care is being rendered. Indeed, during the observations the ambulance crews I was with drove through Midtown looking for some of their “normal customers”:

**Shift 518, Note 6**
We drove past Midtown Plaza, and Harrison made some comments about looking for particular homeless patients that they know. One female was wearing a shiny gold [shirt], and Harrison hit [an electronic horn that is part of the ambulance’s siren system]... and then shouted the patient’s name out the window and waved. They both commented on [the patient] and how her [shirt] was ridiculous looking.

Providers, like those from this shift, described seeing individuals who were both homeless and known to be frequent fliers, but not as patients. Instead they were observed almost like an employee of a store would note the passing of a regular customer on the street, with the acknowledgement that they would be seen again later in the day.

Providers also reported that it was not uncommon to see such patients both in passing and for medical care multiple times in a single shift. One provider described these situations and linked them directly to alcohol use: “it’s when you take someone three times a day for the same problem which is they’re claiming leg pain but they’re really had on their third pint of vodka”. One such series of interactions was recorded during the field observations with a particular patient who was both homeless and a user of substances according to the providers. The first of three interactions occurred early in the providers’ shift:

**Shift 048, Note 10 [Time of Day: “Day Shift”]**
A8 is dispatched to a patient with chest pain. We arrive on-scene to find multiple [Chapman Police Department] units as well as a [Chapman Fire Department] Engine Company ... on location with a patient sitting on a park bench with a person that the providers indicate is her [romantic partner]. They have a Target shopping cart with them that has some possessions and some empty liquor and beer bottles in it. [The other first responders] tell us the patient has been drinking, and both providers
indicate that they know the patient from previous calls. The patient is visibly upset with the police, who she refers to by their first names, for taking her nips the night before. The police officer says that she can’t have them here, patient responds "where are we supposed to go!?" and the police officers say that she can have them anywhere but [Midtown Plaza]. Meanwhile one of the firefighters, who is also a Private [Ambulance] medic, is busy trying to talk to the patient and Charlotte works her way into the conversation. The patient is refusing patient care, and the police tell her that if they are called back they will PC her [place her in protective custody].

This initial interaction was similar to many other calls for patients who labeled as “frequent fliers”. Both providers knew the patient by first name, and the other first responders’ also indicate that they are quite familiar with the patient. The patient, in turn, is also on a first name basis with the police officers. These familiarities speak to the depth of the relationship between first responders and the “frequent fliers” they see regularly.

Being seen “regularly” can take on a variety of contexts, including those outside of patient care:

Shift 048, Note 15 [Time of Day: “Day Shift”]
A8 is dispatched for a “sick person” in a public / elderly housing complex. As we respond through Midtown Plaza, I notice a Target Cart, which I presumed to be the same cart from earlier (there is no Target nearby, and it is rare to see Target carts in the area), flipped over on the sidewalk next to a park nearby the previous seen. The [romantic partner] of the patient from earlier is asleep on a bench, and two others are lying on the ground in the park nearby the cart. The contents of the cart are strewn across the sidewalk.

This second encounter with the patient was brief and passing - the ambulance simply drove past the patient on the way to another call. This speaks to the consistent exposure providers have to “frequent flier” patients in Midtown during downtime, calls for those patients, and during responses to other calls. Later in the evening, the crew I was with crossed paths with this patient for a third time:

Shift 048, Note 24 [Time of Day: “Evening Shift”]
A8 is dispatched to the report of an assault in Midtown. We arrive on-scene quickly and find multiple CPD units out front of a drug store / pharmacy type business. The patient is leaning up against the exterior wall and is crying. The police are trying to reason with her but she is not being cooperative. Charlotte kneels down next to her and asks what happens - the patient says that her [romantic partner] beat her up ...the [romantic partner] has left the scene, and the CPD officers tell her there is nothing they can do because they can’t arrest the [romantic partner] if
they cannot find her. The police tell her they’ll keep an eye out but since they left the area - they just need to stay away from each other. The patient alternates between crying and starting to yell at the police officers. Both Charlotte and Olivia also suggest that patient and her [romantic partner] stay away from each other, and Olivia checks her chin (where she was punched). The patient refuses help and Charlotte tells the police there is nothing they can do. The police remain on-scene as we place the bags back in the ambulance, and the [wet shelter street team] guys, who have arrived while we were talking to the patient, smoke a cigarette with the patient before taking her down to the shelter.

This series of field notes illustrates a number of important points about “frequent fliers”. First, though alcohol use was mentioned in particular during the first interaction the providers had with the patient, the role that substance use played in these interactions was complex. None of the calls were for acute alcohol intoxication, but rather for issues that providers suspected were intertwined with the patient’s substance use. “Frequent flier” interactions can therefore encompass a range of patient complaints, illnesses, and social struggles, all of which may related to substance use. However, the substance use issues themselves may not be the chief complaint on every call. The second important point is that the frequent fliers in Midtown are constantly visible to providers, whether is doing a casual drive through the neighborhood during downtime as with the note from Shift 518 presented above, on the way to another call as in the above example from Shift 048, or in the emergency department as John noted in the excerpt from their interview above. Thus even outside of emergency call interactions, providers are consistently exposed to this population over the course of their shift.

The familiarity that the patient and the providers showed with each other is only part of what makes these calls formulaic for everyone involved. During Tim’s interview, when I asked him what it was like to treat a patient who he knew from previous interactions, he responded simply that “Oh, it’s routine”. It becomes routine for patients as well. During a shift with Tim, we responded for a patient whom he described as “the most frequent of frequent fliers” in Midtown:

Shift 131, Note 3 [part]  
P11 is dispatched to the report of difficulty breathing [in Midtown Plaza]... [Once we arrive on-scene] the patient hops into the ambulance and then puts her seatbelt on right away. Brad laughs a bit to himself, and then asks the patient “what is going on today?” The patient tells him that she is having trouble breathing, and Brad asks some assessment questions, including whether or not she has had anything to drink to day...We learn
that she stayed in the shelter last night and Brad tells me that she was concerned about her breathing so she didn't sleep. The patient indicates that...she wants oxygen. Brad tries to get her to take an oxygen mask...the patient refuses, saying she wants to the nose oxygen (nasal cannula). Brad laughs and opens a cannula package - the patient grabs the cannula out of his hands and puts it on. She asks for the O2 to be turned on to 2 [liters per minute] (which is a correct dosage for O2 via NCO). At this point, Tim turns around and says "are you serious?" from the front of the ambulance. Brad laughs again and checks the patient's blood sugar as we drive to the Mather...When we arrive at the hospital...[the providers] joke with one of the nurses about how the patient put herself on O2 and she seems unsurprised - 'she could probably work herself up' [assess herself and provide herself her own interventions].

This vignette provides another example of a situation where the providers believed they knew who they were responding for and were correct in their assessment. It is also a telling example of how frequently some patients come into contact with the EMS system - this particular patient understood what the treatments would be for her claim of respiratory distress down to a reasonable quantity of liters per minute of oxygen. This is perhaps the epitome of the frequent flier experience from the patient’s perspective - an intimate knowledge about the inner workings of the system they pass through on a daily basis. It is these patients, whom John called “normal customers” and Tim called “the most frequent of frequent fliers”, that give Midtown such particular prominence in the minds of providers.

*Stigmatized Views of Patients and Illnesses*

The end result of these interactions with patients in Midtown can be real, visible frustration on the part of providers. In the last quote from the fieldnotes in the previous section, both paramedics looked defeated the moment they heard the dispatch information go out for that call. When asked what it was like responding to these sorts of incidents where the paramedic knew or thought he knew who the patient would be, one provider responded during the interview that:

Charlie: ...it's day to day ...it depends. Some of them—some days they're nice and if they're nice I'll be nice to them...it's a—are they yelling when you roll up? Are they yelling at the cop? Are they yelling at you? Are they yelling at bystanders? Are they so gorked out of their mind that they're taking a leak in the middle of [Riverside] Avenue? In the middle of the day? It can be frustrating. If they're being nice, I'll give them the benefit of
the doubt. I believe every day is a new day...[But ] it can be draining. It can be wearing, though. If you seen them multiple times in a shift it can be draining.

There is frustration, then, with specific instances of patients who are yelling, potentially violent, or otherwise participating in something deviant like urinating in a street. Providers also hold, however, more deeply rooted frustration with the patterns of system use and “abuse” that they perceive. The net effect of repeated encounters with “frequent fliers” is the development of intersecting stigmatized attitudes about homelessness, substance use, and mental illness that result in a more fundamental aversion to this patient population. This attitude appears in the above quote from Charlie, when he notes that “so and so has been drinking, he doesn’t have any medical problems, doesn’t need to go to the hospital”. This distinction of alcoholism from being a “medical problem” occurs frequently when discussing “1-37D’s” with EMS providers at Private Ambulance.

Many of the providers, then, have negative feelings about working with patients who are substance users. When asked about this population, one provider noted “well...I don’t have many positive things to say”. Providers construct these patients not just as lacking a medical need, but as active “abusers” of the EMS and social safety net systems. This is a separate distinction from labeling patients as “substance abusers”. Rather, “abusers” in this context are patients who misuse the availability of EMS resources:

CP: What’s it mean to be an ‘abuser?’

Joe: Um I would say...drinking multiple pints of [“Rossiya”] everyday and...calling EMS for a transport because you’re not feeling well. That’s an abuser of uh the money that you’re given by the government and the public services that we give.

“Rossiya”, is a locally produced, cheaply priced, foul smelling vodka. When asked what the types of alcohol they were seeing abused were, over half the providers (n=17) answered that it was “cheap vodka” with approximately a third of all providers (n=11) naming “Rossiya” explicitly. It can be purchased, providers said, for several dollars a pint. During visits to the Midtown area at several different points in the study, I noticed the clear plastic bottles it comes in discarded on sidewalks and in gutters. “Rossiya”, like “1-37D”, was therefore used a label to indicate a
particular population. As one provider put it, “It's mostly your high octane low cost stuff, so we’re not talking about our craft beers here. We're talking about like cheap vodka. The stuff that would pass as motor fuels in most other countries”. The association with this type of alcohol with the “1-37D” population was made clear by providers, as was the extension that these individuals abused the system.

Providers gave similar accounts of homelessness, describing those patients as attempting to game the system so that they could get a warm bed to sleep in or a meal at the hospital - “three hots and a cot” as one provider put it during a EMS shift observation. Providers felt that patients who were homeless would lie about or exaggerate their symptoms to get these things:

Nora: And they really, probably not, I shouldn’t say they’re lying, but sometimes there’s many that you work up for chest pain, if they said they have chest pain, they have chest pain. But they’re trying to get... They’ll admit it. They’ll say well I want a sandwich, you know, whatever. Sure, I bet you do. You know what I mean?

Another provider noted a similar phenomenon with homeless patients in Midtown:

Charlotte: Most of them are intoxicated... If they’re not intoxicated, they were intoxicated. And now they want to go to the hospital, for generally a reason, an ailment that they describe that isn’t real. You know, whether it’s shortness of breath, or chest pain, or diabetes, that’s what we get. They’re not really having those symptoms, we can’t tell them that, but when you bring them into the hospital and they check them all out and they realize that you’re not, this isn’t real, that’s when we find out that that person really didn’t have a blood sugar of thirty or something.

The homeless, then, are constructed as individuals who will do anything - up to and including lying - to gain access to shelter and food. Similarly, substance users are “abusers” of the system in addition to being abusers of a particular substance. This is particularly true for individuals with chronic substance use issues as opposed to college students or others who are treated for substance use but are not considered to be “frequent fliers” by providers.

These views inform providers’ overall responses to individuals who have either substance use disorders or who are homeless, but appear to be magnified when it comes to patients labeled as “1-37D’s”. When one provider was asked about working with patients who are substance users, the conversation drifted to patients who are frequent fliers and the paramedic told me that:
Ed: ...when I’m taking the same patient four times for the same exact thing and it’s a lay person can understand that it’s bullshit every single time, it’s the most frustrating, infuriating feeling in the world...Because you, they’re wasting resources. And it’s not like we have something better to be doing like a cardiac arrest that’s not getting help because we’re helping you...No, it’s just wasting my time because I do it every single day, and you never change, and you never follow the programs that are set up, the social programs for you. And that makes the other wave of compassion just disappear... And it’s just due to the sheer volume of how many times you see these patients. I see patients more times in a week than I see my family in a year.

For this paramedic and others, patients’ inability to get sober or get off the street further evidence of their own personal failings. This is a viewpoint that again repositions providers’ attention from alcoholism as an illness towards alcoholism or homelessness as the product of personal, internal failures that do not require medical attention. Patients who are identified as “1-37D’s” are not just individuals whose behavior (being intoxicated in public, urinating in the street) stands out to providers, but also individuals who have personally failed.

For providers, patients who fit the “frequent flier” and “1-37D” labels are the physical embodiment of “grunt work”. CHAPTER 7 described EMS work with patients in a number of groups as “shit” or “grunt” work in the first sense, that it was work with undesirable patients from a variety of populations. Work with the “1-37D’s” who are “frequent fliers” fits both this broad sense of “grunt work” as well as the conceptualization of “grunt work” as dirty work. The “1-37D” patients had a reputation for the smells that often accompanied them, which could include “urine, or feces or alcohol, ... [or] body odor.” Another provider said simply that “they smell, they usually smell” before going on describe the smell as a “football locker room with socks in there for years” and warning that removing these patients’ shoes was a bad idea. During the EMS shift observations, some patients smelled so strongly like feces that providers gagged as they neared the patients. Other providers described “1-37D” patients who defecated on the floor of the ambulance. The olfactory experience of working with “1-37D” patients, and the need to air out and disinfect ambulances that had been significantly soiled, gave these calls a reputation of literal “shit work”.
The stigmas providers held about homelessness and substance use were therefore the product of a number of different frames. Providers see these patients as generally undeserving of care because, as noted in CHAPTER 7, these are calls for issues that do not fit with the definition of EMS as an acute care system. Beyond that dissonance, providers view both chronic substance use and homelessness as the products of individual failures of patients who are willing to “abuse” EMS and emergency department services. When combined with the dirty nature of these calls and the association with disorder (such as public urination), these frames emphasize the particularly problematic nature of this work for providers.

*The Social Production of Neighborhood Stigma*

The overwhelming focus providers have on the Midtown neighborhood is the product of a number of intersecting stigmas - about substance use, homelessness, and the negative characteristics associated with “1-37D’s” and patients who drink “Russiya”. These overlapping and intersecting stigmas (Logie et al. 2011) intersect on a particular neighborhood, with providers associating this particular population of patients with Midtown in ways that generate a spatial stigma as well - a notion that Midtown is somehow spoiled as a neighborhood. During the semi-structured interviews, a Paramedic who lived in Chapman described the neighborhood they lived in as ideal because it was far away from “the homeless”, describing the “bad parts” of Chapman as the “drunk shelter” (i.e. the wet shelter) and Midtown. Other providers, though not all, described avoiding the neighborhood if they could during off duty hours so that they did not run into some of their “regular customers”.

During shifts, providers used dispatch information that located calls in the Midtown area as a key piece of information for anticipating the type of call they would see. As I described in CHAPTER 4 (see pp. 84-85), the dispatch information transmitted to Private Ambulance was often sparse, directing ambulances to response to an address for what was often a two or three word description of what may have been wrong with the patient. In particular, providers
assumed that, given a particular set of dispatch information such as for the “man down” in Midtown, they will be seeing one of their frequent flier “1-37D” patients:

CP: What clues you into that [thinking you know who the patient will be]?

Rachel: The region. If I hear that it’s going to be a 47-year-old female in [Midtown Plaza]...you know, who’s down on the ground, I can with pretty much 90% accuracy guess who exactly the patient is... If it’s in that area, I’m almost positive that [the caller] is, it’s a bystander who doesn’t know the area very well, sees someone there, and doesn’t understand that we have this homeless population that are a bunch of alcoholics, and who are very, almost all the time drunk. So they don’t know that this is regular for us, and that we see that. So when I hear that, then that to me, it’s the region that I know that it’s not going to be the person who is unconscious for some strange, weird reason. They’re probably just drunk and don’t want to wake up.

Beyond the repetition of the argument that they’re “just drunk”, this quote underscores the association of Midtown with homelessness and substance use. Another provider concurred, noting that “but a lot of time in [Midtown Plaza], it’s all drug or alcohol-related; and most of the time, homeless.” Providers contrasted this population with the homeless population in other parts of the city

Ryan: ...The homeless typically that we deal with are the ones that kind of reside in [Midtown Plaza]. Those are the more of the substance abusers. If I had... geographically to tell the difference between homeless in [Midtown Plaza] and the homeless in [University Plaza], the homeless in [University Plaza] homeless patients are typically not—you’re not finding those as substance abusers. They’re just kind of more of the strange folk that live around that area. They don’t really tend to bother anybody.

This contrast in populations between Midtown and the Old Quarter, where University Plaza is located, is an important one. It speaks to differences between the perceived distribution of homelessness noted earlier and the data from the Chapman Police Department calls for service data. Midtown suffers, then, from the convergence of two stigmas - a stigma about homelessness and a stigma about substance use - on a particular geographic area that providers identify based on this convergence. Midtown, for EMS providers, is analogous with homelessness and substance use. This identity leads to the formation of a third stigmatization, this time aimed at Midtown itself. Like a person who is homeless or has a substance use disorder, Midtown suffers from a “spoiled identity” (Goffman 1963) that has consequences for EMS providers and patients.
**Structural Forces and Disordered Space**

The convergence of homelessness and substance use on Midtown is not accidental or random. Indeed, the earlier description of ‘Midtown’s Social Geography’ (see this chapter, pp. 178-181) noted the variety of services available to individuals with housing instability or substance use issues in the immediate area of Midtown Plaza. These included a social services building with services aimed at these populations, a harm reduction program, liquor stores, and other businesses (a chain fast food burger restaurant and convenience stores) that offered low cost food to a variety of individuals including those who were homeless. The main area of Midtown, situated along Main Street, also housed a number of shelters for both men and women. These shelters in the immediate vicinity of Midtown were “dry” shelters because they did not allow residents to be actively using substances while they stayed in the shelter.

Yet Midtown itself was known by providers for a different facet of the homeless population, the “1-37D” individuals who used a different shelter. The impact that this shelter had on the neighborhood is important, particularly since it is located at the very fringe of Midtown. When the definition of Midtown generated using sketch map data is utilized (see this chapter, pp. 177-178), the shelter itself falls outside of the neighborhood in an adjacent Census Block Group. The so-called “Midtown effect” discussed in this chapter is therefore not solely a neighborhood effect, but an effect driven both the neighborhood itself (the resources available as well as the stigma associated with Midtown Plaza) as well as the inter-neighborhood linkages between the “wet shelter” and the “Mather Hospital”, each of which are located about a mile from Midtown Plaza itself (see FIGURE 8.6, p. 324).

Providers described Midtown Plaza as being along the walking route between the “wet shelter”, the Midtown Plaza area, and the “Mather Hospital” where many of the “1-37D’s” were transported. The cycle of patients between these institutions and Midtown Plaza was noted by providers both during the EMS shift observations and the semi-structured interviews. Patients, according to providers, would stay in the shelter and then spend the day drinking in Midtown...
When they had become so intoxicated that they could not walk, they would be transported to the Mather Hospital’s “drunk tank” where they would sober up and be discharged. Shortly thereafter, providers would report finding these individuals in Midtown again. One provider described this congregation of patients at Midtown Plaza as a “pack”, another as a “pack of wild dogs”. The result is what providers see as near constant disorder. One provider described Midtown:

Paul: I mean you’ve got people that have nothing, or they’re on drugs, or they want to be on drugs, so they want a fix. Now...they’re mixing in with professional people, or people that are going to work, or have money, or have things that they want. And I guess sometimes, that’s where you see bums, you see robberies, we do get those. There [are] assaults down there. Them fighting with each other, or fighting with other people.

Other providers described individuals sleeping and releasing themselves in plain view in the public spaces in and around Midtown Plaza. When these behaviors result in contact with law enforcement or a member of the public who calls 9-1-1, Private Ambulance would often be summoned to assess the patient and potentially transport them to the ED.

This represents two “cycles” for “1-37D” patients. One of the cycles is through the social and emergency services systems, with individuals moving between these various institutions sometimes multiple times per day. This “institutional cycle” is important because the EMS system is the physical, connective link between these institutions. They are often the gatekeepers who make a determination about whether a patient can walk (“ambulance”) well enough to be funneled back into the shelter via transport provided by the homeless outreach workers or the Chapman Police Department. Similarly, Private Ambulance provides a means for accessing the Emergency Department at the Mather Hospital.

The second “cycle” is a spatial one. As individuals who are labeled as “1-37D’s” move through the “institutional cycle”, they navigate a number of different neighborhoods (sometimes on foot, sometimes as passengers in an ambulance or one of the vehicles used by homeless outreach workers) that intersect at Midtown Plaza. The Plaza is therefore an inflection point between the two major institutions that serve individuals who are “1-37D’s”, the “wet shelter” and the “Mather Hospital”. This spatial cycle is important not only because of the very real consequences
it has for EMS work in Chapman but also because it illustrates the importance of thinking about the ways inter-neighborhood institutions link neighborhoods together in cities (Sampson 2012). These linkages have not traditionally been the focus on the neighborhood effects literature, but the “spatial cycle” described here illustrates the importance of these on the daily reality of EMS work in Chapman.

The Consequences of Midtown's Stigma

Analyses of the qualitative data collected during the EMS shift observations and semi-structured interview phases of data collection identified two broad consequences of the overwhelming focus on Midtown that providers describe. The first, the practice of “informal exclusion”, is an expansion of the role of other first responders (i.e. the police) in “moving” and “pushing” the homeless into certain areas of cities (see Stuart 2014). In Chapman, the EMS system is implicated in this process of managing homelessness in Midtown. The second consequence is what providers call “getting burned” - misattributing or writing off signs and symptoms of a “real illness” as the consequences of homelessness or substance use. This section describes both consequences, beginning with the EMS system's role in enforcing exclusionary policies that limit the activities of homeless individuals in Midtown Plaza.

Informal Exclusion

The first consequence of note is a shift in the role of EMS providers from treating medical issues towards managing the use of space. Midtown Plaza is an example of a prime space (Snow and Anderson 1993; Stuart 2014) that is primarily occupied and utilized by “mainstream society” (Stuart 2014:1910). The bulk of the literature on prime spaces and the geography of homelessness has focused on the role that police play in “rabble management” (Stuart 2014), yet in Chapman the EMS providers play an important role in this process as well.

Noah: [Main Street], [Midtown Plaza], mostly where the homeless are, people are homeless if they’re sleeping on a bench, they’re sleeping in day camps. They usually call us to come move them or take them if they can’t walk. If they’re too intoxicated, we take them to the hospital… If they can
walk, they walk away and we move them to another area. Or if they want to go to a shelter, we’ll get them transportation to a shelter.

This quote summarizes the patient disposition options available to providers earlier, but is important because of the comment that “they usually call to come move them”. There is a notion, then, that the EMS system plays a role in the movement of the homeless out of Midtown with its busy commercial strip that abuts the Plaza that the homeless frequent. Interactions with the homeless often underscore some form of admonishment for spending time in Midtown or other prime spaces. For example, the interaction described over three field notes from Shift 048, described in the “Frequent Fliers” section (see pp. 184-188), includes a comment by a police officer that the patient could have alcohol anywhere but in Midtown. This potentially incentivizes patients to seek other, “marginal spaces” (Stuart 2014) for drinking, sleeping, or passing the time.

Two paramedics that I spent a shift with utilized a more confrontational approach. During the evening, we were dispatched to a call in Midtown. The following are notes from that interaction:

Shift 376, Note 27
P11 is dispatched to a reported man down near Midtown. We respond, and find a CFD engine company on location along with the patient and a CPD officer. The engine company does not have much information because the patient has been uncooperative. Dave talks to the patient, and explains that he is concerned about her because the caller stated that she had been losing consciousness. The patient becomes frustrated with the providers and eventually tries to walk away - she insists that she is fine and she is just hungry. They ask why and she explains that she has not eaten at all today. Her real frustration is that she is allegedly banned from the shelter and that some of her property is at the CPD station because of an arrest on outstanding warrants earlier in the week. The CPD officers confirm the arrest (they indicate that they recognize her).

Another CPD officer arrives. She tells us that the patient is a “junkie” and that she has a history of substance use, that the patient can wait until Monday to get her property back, but she does call down to the shelter and confirms that the patient can stay there but they are full for the night. Dave emphasizes that the patient cannot stay in Midtown because "it's not safe for you here". Dave states that he "would feel better if you went to [the shelter] or to the hospital." The shelter is not an option and the patient refuses to go the hospital. Dave is becoming more frustrated, and tells the patient that "if we come back for you again you won't have a choice" about going to the hospital. The patient is very upset now too, insisting that her problem is that she hasn't had enough to eat and that
she doesn’t need to go to the hospital. Jeffrey tells her that "we can’t tie up trucks for this". Dave obtains an AMA signature from the patient and we leave.

During all of this, we are in a 50’ stretch of street near a transit station and some bus stations. Numerous people walk past on the sidewalk, staring at us and the patient. It is dark out, but the lights from the street and nearby businesses light up the scene. Empty liquor bottles and bottles of hand sanitizer nearby.

A short while later, after driving north into the Old Quarter to take care of an errand involving a patient who had been receiving frequent care from Private Ambulance recently, we were again called back to Midtown:

Shift 376, Note 29
P11 is dispatched again for the man down in Midtown. Both providers react immediately, saying that they assumed that this was the same patient as before. They reiterated their insistence that she would be transported to the hospital this time. We arrive on-scene at the same place where we left the patient beforehand. This time, the officers are across the street and do not respond with us to talk to the patient. Dave and Jeffrey both get out of the ambulance and immediately insist that the patient be transported. They tell her that someone saw her passed out again, the patient responds by insisting that she is sleeping. She asks where she is supposed to sleep, and Dave respond "somewhere where people won’t call 9-1-1." She asks where that is, and Dave says "I don’t know...I don’t have that answer for you...you gotta be responsible for that." The patient insists over and over again that she does not know where to sleep as we drive to the hospital. Dave continues to insist that the patient cannot sleep in Midtown because people will see her and call 9-1-1.

Dave tells the patient that she has to go to the hospital. They get the cot out and pick the patient up and place her on it. The patient protests, but they place her in the ambulance anyway. Once we arrive in the ED, Dave communicates to the ED staff that they had seen the patient twice now this evening, and that people had kept calling stating that the patient was passed out on the sidewalk. The patient continues to insist that she was just sleeping, and the hospital staff admonishes her, telling her that "college is back in session now and we can’t have people sleeping out [in Midtown]."

This is but one example of providers mentioning to patients that their behavior was “not allowed” in Midtown. Enforcement of this informal prohibition on certain behaviors is first attempted by threatening patients, sometimes with protective custody by the police (as in the previous example Shift 048, described in the “Frequent Fliers” section, see pp. 184-188) or sometimes with transport to the hospital as in the above example. Providers will often remind
patients that they cannot be in a particular area. In both the previous example and the above example, patients asked where they could go and were not given an answer. The response in these cases and others was along the lines of ‘I don’t know where you should go, but I know it’s not there’. In the above example, the paramedic invokes the notion of personal responsibility, adding that it was up to the patient to find a suitable location to spend time out on the street.

"Getting Burned"

For providers, however, “moving [patients] along” presents a risk. If that patient does have a ‘legitimate’ medical concern (in the eyes of the EMS providers), there is a risk of a negative health outcome for the patient if they are not treated. This opens the providers to risk both in the workplace and to potential legal risk if their behavior was negligent. Each interaction for providers, then, results in a decision making process for the providers about the appropriateness of the chosen disposition. In the example from Shift 376 in the previous section, the paramedics had the patient sign a form after their first contact with the patient. The form advised the patient that she had been warned about the risks of not being seen at an emergency department.

Making the wrong decision can result, as providers call it, in “getting burned”. One provider recounted an experience of getting burned from several years prior to the interview:

James: ...got called to [Midtown Plaza] one of the ATMs, for the seizure. And, um, walked in and there was a male who looked like your typical homeless man, ya know person, kind of raggedy clothes, he smelt bad, um, unshaven, just didn’t look like a guy who took care of himself. He was laying in the ATM. And I was like kind of like yeah ‘get up,’ I assumed he was drunk, just passed out in the ATM. And I’m trying to drag him out, he could barely walk. And I’m like ‘come on, come on.’ Get him in the ambulance, drive him to the hospital. Get his name, the whole time in the back he kept holding his head “I don’t feel good I don’t feel good” I just wrote him off as a drunk. Got to the hospital, gave a shitty report- drunk guy in [Midtown Plaza]. Came to find out he was in renal failure and hypotensive and he went to the ICU. So ever since then- well I left, I took a break. Um so every time now...when I go to [Midtown Plaza] and I go ‘this is bullshit,’ I’ll take the time to do my job, so just to make sure they’re not really sick.

This experience, in which a patient with low blood pressure and kidney failure was assumed to be “your typical homeless man”, represents a cautionary tell for many providers. James
connected the experience of getting burned to the larger associations providers make between patients with substance use disorders or patients who are homeless. He also noted the ease with which providers label the symptoms of patients originating from Midtown Plaza as “bullshit.” In particular, he noted how easy it was to pass symptoms off as a patient ‘just being drunk’ when in fact they had more complex medical issues:

CP: And what’s it like when you show up and you do know the patient?

James: Um...you, um when you get there and I see him I just go oh it’s so-and-so I'm not too worried about it. Ya know Unless they do have a specific complaint, like short of breath. Ya know I’ll take the time and really, ya know, really assess them fully to make sure I don’t get burned and miss something.

CP: What does getting burned entail?

James: Say you’re picking up the same person 3 times a day, almost everyday, and they could say ‘you know I’m short of breath’ but they’re talking, ya know speaking to you in full sentences and showing every sign that they’re not short of breath, but the day they are short of breath you’re fed up, mostly because they start to wear on you... or you’re kind of like ‘yeah yeah come on to the hospital,’ and you just kind of sit in the back and ignore them, cause they’re being themselves, but they can actually be having a medical problem and you miss it when you bring them to the hospital. You pass it off ‘yeah it’s the same thing he’s been drinking’ and then the hospital will do a full assessment and find something wrong, like he was having a heart attack or something.

James singles out the experience of “frequent flier” patients, particularly those who have a reputation among EMS providers for exaggerating symptoms, as a particularly problematic group in terms of getting burned. This provider also notes the frustration that can enter providers’ heads when they deal with “frequent flier” patients by describing these interactions as ones that “start to wear on you”.

Other providers recognized the risk that “frequent flier” patients posed to providers’ decision making. For these patients in particular, there is a sense that they are like “the boy that cried wolf” as one provider put it:

Harrison: ...The boy that cried wolf thing fits into this hugely because we get sent to the chest pain at [University Plaza] so many times, and you get there and it’s the same guy who knows that if he says he’s having chest pains, he’s going to the hospital, no questions asked. So you get this kind of mentality in your head that it’s a poison that you can’t let it get in your head, but you’re like oh here we go again, just another drunk.
Misdiagnosis is of course a risk in any medical interaction, but for providers who treat the same patients over and over again for issues that the providers characterize as “bullshit”, “crying wolf”, “abuse”, or manipulation, it can be difficult to maintain focus on the reality that each interaction could be due to a serious medical issue. One provider described this difficulty:

Drew: ...so its very hard sometimes to...like maintain a level of attitude with them. you don't want to get complacent in dealing with them because 9 [times] out of 10, they are just drunk. but that 1 out of 10 [times, they] could have a real medical emergency but because [of] those other 9...like the boy who cried wolf, because they, they were just drunk those nine times you can...its hard to fight the urge to just say, ah here you go again its another drunk, let's just transport him. he could actually have a real medical problem.

Getting burned, then, is a particular risk with these patients because providers become inured to them over time. When combined with the stigmas providers associate with substance use and homelessness, as well as the overarching assumptions providers make about patients in Midtown, the tendency to make assumptions about patients can be especially dangerous.

The outcome of such assumptions can result in delays in care, as in the example from James the beginning of this section, or unnecessary interventions. One night during the field observations, the crew I was “riding third” with was asked by the Mather Hospital Emergency Department staff to assist in stabilizing a patient that another ambulance had brought in. That patient was a “frequent flier” who regularly spent time in Midtown, according to the providers who I was with, and was having complications from diabetes. The ambulance crew who initially treated the patient had assumed, I was told, that the patient had just been drunk and had not investigated their altered level of consciousness further. The result was a number of interventions in the ED that would have otherwise been unnecessary had the low blood sugar been identified sooner. Negative health outcomes such as this are the ultimate consequence of “getting burned”.

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Providers’ perceptions of their work, as identified both through the sketch mapping exercise and the interview transcripts, focus heavily on the Midtown neighborhood. This was seen both in the sketch map data presented in CHAPTER 7 (see pp. 166-167) as well as the qualitative and quantitative data presented here (see ‘Providers’ Perceptions and Midtown’, pp. 181-183). In particular, the regression models presented in TABLE 8.5 (see p. 323) describe the amount of variation in provider perceptions of their work that Census Block Groups located in Midtown explain. This explanatory power holds even after controlling for “objective” measures of EMS work and demographic factors.

The focus providers have on the Midtown neighborhood is driven by the presence of patients who are homeless and who have substance use disorders, but most importantly, are identified by providers as frequent users of EMS and emergency services. The labeling of these patients as “1-37D’s” and “frequent fliers” creates a culture where providers assume that complaints made by these patients are illegitimate or, worse, deliberate attempts to mislead them. The association providers make between “1-37D’s”, “frequent fliers”, and the Midtown neighborhood results in the production and reproduction of neighborhood stigma. There is very little empirical assessment of how neighborhood stigma is created (see Besbris et al. 2015 for one of the few empirical studies of neighborhood stigma), though a significant body of work has theorized its existence and implications. In Midtown’s case, neighborhood stigma is itself the product of multiple intersecting and overlapping stigmas related to providers’ views of particular types of patients and illnesses. These views have to do both with a wider understanding about “appropriate” use of EMS services and the degree to which substance use and homelessness are valid clinical and social issues. These stigmas also result from the connection providers make between work with “1-37Ds” and “grunt work” both in terms of their association of “1-37Ds” with undesirable tasks and the literal dirty nature of these types of calls.

The consequences of these types of calls result in a bias among providers towards these patients that takes on two forms: a drive to “move along” the homeless from Midtown Plaza. This process of informal exclusion has been documented elsewhere in the case of law
enforcement, but in Chapman the EMS system is implicated in this work as well. This reflects a tendency to medicalize both deviance and homelessness. It may also reflect the reality that many of the “1-37D” individuals do in fact have substance use disorders that make medical care a more appropriate disposition than a police holding cell. Yet EMS providers have few options other than securing alternative transportation for individuals to the “wet shelter” or transporting the patient to the Emergency Department, given these calls a cyclical feel where patients rotate between various social and medical institutions by way of EMS care and transport.

The cyclical nature of this work and the frequency with which providers interact with the same patients time and time again raises the risk of the second consequence of Midtown’s stigma - the risk of “getting burned”. Providers’ assumptions about “1-37D” patients, including the association of particular addresses and types of dispatch information with this population, feed a perception that these patients cannot always be taken seriously. Yet these can in fact be sick patients with “legitimate” medical needs, which a number of providers conceded, and “getting burned” entails a mistake whereby providers misattribute a patient’s symptoms as the consequences of substance use when in fact they reflect a different medical issue, such a low blood sugar. These powerful assumptions therefore put providers’ careers and patients’ safety at risk if providers become inured to the constant exposure they have to certain “frequent flier” patients.
CHAPTER 9: Discussion - A Contextual View of EMS Work

The preceding five chapters have laid out a detailed description of the ways spatial contexts affect Emergency Medical Services (EMS) work in an urban setting. This theme fits into larger trends within both the sociology of health and illness (Kawachi and Berkman 2003) and urban sociology (Sampson 2012) to place context at the center of our understanding of inequalities across a variety of social and health outcomes. To address this interest, I proposed four research questions in CHAPTER 3 that I hoped to address through the mixed methods data collection and analyses discussed in that chapter. These questions are summarized in TABLE 9.1 (see pp. 325-326) along with the relevant findings for each question. This chapter begins with a summary of those arguments and a discussion of the ways in which this work contributes to knowledge in the three most prominent sociological subfields that inform this work - urban sociology, the sociology of health and illness, and the sociology of work. This re-situates the analytical chapters within the bounds of the project’s research questions despite these chapters’ organization along thematic lines.

After discussing these connections, I turn my attention to the implications of this research for the EMS community itself. These implications highlight the prominence of low acuity
patients in EMS settings and the broader role that the EMS system plays as part of the social safety net. Finally, I discuss a number of methodological limitations that must be considered in interpreting or understanding these findings. These limitations fall chiefly into two groups - data limitations, and analytical limitations. The data limitations include the reliance on dispatch information as a proxy for the types of medical issues found in EMS settings and the lack of patient level data. The analytical limitations include issues of sample size, spatial autocorrelation, and normality that may impact the statistical findings presented here.

**Context and Contradiction in Urban EMS Work**

These findings (see TABLE 9.1, pp. 325-326) point to a number of larger conclusions about how work, health care, and urban space are organized. Urban EMS work is defined both by the context within which occurs and the contradictions inherent in the way EMS care is organized in the United States. Context in EMS work is important at two levels - the institutional context within which the EMS system is situated and the spatial context within which EMS care takes place. The contradictions this research identifies, over the non-acute nature of EMS work and the large proportion of work focused on marginalized populations, stem from these dual contexts. This section explores these contexts and contradictions, beginning with the larger institutional context within which the EMS system is situated before addressing the organizing of EMS work and its implications for urban space.

**Institutional Context: EMS and the Social Safety Net**

Questions two and three (see TABLE 9.1, pp. 325-326) both speak to the ways in which EMS providers are part of a larger medical and social safety net system. Question three focused on Mannon’s (1992) notion of EMS as “street level social workers”, which was described by providers at Private Ambulance as “bullshit” or “grunt” work. In Chapman, providers treat and transport a wide range of patients that fall into this category, including patients with psychiatric or substance use issues, patients who are homeless, and patients who have sub- or non-acute
chronic illnesses or injuries. EMS providers in Chapman particularly sensitive to these calls, framing them in ways that leave them open to “getting burned” if they reject calls out of hand based on dispatch information (the focus of question two) or a patient’s status as a “frequent flier”.

The issues that were identified through questions two and three are fundamentally questions about the role of EMS providers as part of a wider public health system. Much of the preceding chapters have focused on the EMS system exclusively without much attention given to the points of intersection between EMS providers and other health care workers, first responders, and social service providers. Though the EMS system does not operate in a vacuum, it can be isolated from these other institutions in ways that ultimately detract from EMS providers’ ability to provide patient care. In Chapman, for example, Private Ambulance and the Chapman Fire Department collaborate on a daily basis to provide patient care and regularly train together. The same cannot be said for the collaborations between Private Ambulance and the medical staff at the “wet shelter”, which appeared to be far more limited in nature despite the large overlap in patient populations between the EMS system and the shelter itself.

That Private Ambulance is better integrated into the Fire Department than the existing social safety net institutions is not accidental nor is it surprising. This institutional orientation is a product of conceptualizing the EMS system as an acute care first response system rather than a pre-hospital medical system that treats a wide range of maladies and injuries, few of which require the advanced interventions that Paramedic training is premised on (IOM 2007a). The data presented as part of questions two and three leads me to suggest the EMS system is better thought of as an under-appreciated element of the social safety net. This contradicts the official framing of the EMS system as a “21st century trauma” and acute care system. In Chapman, Private Ambulance works routinely with patients who are marginalized, socially isolated, and fit into one or more socially stigmatized populations (including being homeless, poor, mentally ill, or a substance user). This work, which Lincoln and I elsewhere characterize as the treatment of “everyday health crises” (forthcoming), represents the daily reality of urban EMS work. My
findings here therefore both underscore and extend our previous work as well as earlier observations (Mannon 1992) by sociologists about the function of the urban EMS system.

Urban EMS work is not only about providing safety net services, but about providing institutional links between these services as well. The EMS system is the connective tissue that links care given by community health workers and hospitals for patients who require additional care. This is true for so-called “inter-facility transfers” (Prener and Lincoln forthcoming), but also between community care settings and hospital EDs. In Chapman, this role appears to be most prominent for patients who are the most marginalized - those who lack housing, have substance use issues, or have psychiatric problems. Moreover, these patients are treated on a regular basis, contradicting the notion that the EMS system exists for short, one-time instances of care. For these patients, who themselves may have weak ties to a variety of social and medical institutions, the EMS system serves as a bridge between these social and medical organizations and hospitals.

*Spatial Context: EMS as an Inter-neighborhood Institution*

The EMS system bridges institutions, but it also connects different neighborhoods of a city. Both questions one and four (see TABLE 9.1, pp. 325-326) focus on these spatial connections, though from different viewpoints. Question one focused primarily on downtime, the lulls between emergency calls that make it possible for providers to rest, refuel, and socialize with one another. Downtime was shaped significantly by where it took place, with the most prominent areas identified as what I call focal points for socializing and interaction with coworkers. Question four, on the other hand, focused on the spatial distribution of work with a particular focus on the ways in which providers routinely focused on a single neighborhood as a source of much of their work. These analyses make clear that EMS work occurs in every neighborhood of the City of Chapman, but that calls occur in some places with far more frequency than others. Thus, while the EMS system theoretically connects every neighborhood to a set of health care institutions (namely Emergency Departments), it is certain areas of the
city that have particularly strong connections between place and the EMS system.

Moreover, the case of Midtown illustrates the ways in which other inter-neighborhood institutions, in particular the social and health care agencies that serve homeless individuals and those with substance use issues, shape the EMS system. It is not just that Midtown and, in particular, Midtown Plaza represent concentrations of “1-37Ds” who are “frequent fliers” in the eyes of EMS providers, but that Midtown is really the inflection point between these various services. Place effects in EMS work therefore illustrate the importance of thinking beyond neighborhood boarders.

Focusing on inter-neighborhood institutions also moves the debate over neighborhood effects away from questions of composition and selection that have dogged the literature for much of the last decade (Diez-Roux 2004; Oakes 2004; Sampson 2012; Subramanian 2004). This is particularly the case when, as I have found with EMS providers, institutional perceptions of neighborhoods are not driven solely by compositional factors. EMS and other inter-neighborhood institutions are not endogenous aspects of neighborhoods (however operationalized) and their spatial organization is a product of both the spatial heterogeneity of communities and the connections across and between neighborhoods. EMS responses in Chapman reflect these connections as well as aspects of individual neighborhoods, making the EMS system (and other inter-neighborhood institutions) a useful barometer for the spatial organization of urban social problems. In the case of EMS work in Chapman, the system therefore reflects the spatial organization of extreme poverty (in the form of homelessness) and the spatial contours of other social problems such as heroin and alcohol abuse.

However, the EMS system also has a hand in responding to and treating these social problems. Providers’ responses to these problems and the patients that have them may therefore reify not only the problems themselves but particular neighborhoods as “marked” spaces. Thus there ability to ‘move patients along’ by enforcing informal spatial exclusion may help shift a neighborhood’s reputation. Likewise, the failure to respond adequately to patients (what providers term “getting burned”) may only seek to further entrench the perception of a
neighborhood as a ‘sick’ community if those patients return there after their release from the hospital. Thus, by focusing on inter-neighborhood institutions whether they are first responders or a public works focused “constituent relationship management” system (O’Brien, Sampson, and Winship 2015), it becomes possible to understand both the spatial occurrence of social problems as well as the varying degrees to which institutions respond to these phenomena.

What is interesting about this duality - where the EMS system both reflects and shapes the social problems endemic in Chapman - is that it further complicates the notion that the state has “retreated” from the most marginalized communities in cities (Wacquant 2007). On one hand, the regular repeated involvement of these communities with the EMS system challenges such a notion of retreat that has received critique in other quarters (Squires and Lea 2013). On the other, the privatization of EMS services (of which Private Ambulance is but one of many private companies, some of which operate ‘for profit’) speaks to the very neoliberal conditions that Wacquant articulates across much of his urban sociology project.

This also raises an important question, and one that speaks to the generalizability of my research. Wacquant (2007) writes principally about the African American ghetto experience in the United States, which is a phenomenon that Chapman does not contain. Based on my findings, I would argue that inter-neighborhood institutions can be chameleon-like in that they reflect the conditions of marginality that are most salient in the communities they serve. The lack of race or class (beyond the most marginalized community of the street homeless in Chapman) as salient predictors of EMS providers’ perceptions may reflect only the largely integrated and racially diverse reality of Chapman. Other services in cities with larger areas of “advanced marginality” (Wacquant 2007) may indeed see fault lines emerge along racial or class lines. Studies in emergency departments have indeed found troubling inequalities based on race (see CHAPTER 2, p. 43), so their presence in EMS work would not be in the least surprising.

These fault lines, when they emerge, are inevitably intertwined with the employment regimes and workplaces that represent these institutions’ in the community. These institutions are not merely abstractions but are embodied in and require the participation of the individual
employees who work within them. Spatial context is not just a question for urban sociology; rather, it is something whose influence cuts across the plethora of research interests that make up sociology (Gieryn 2000). Despite sensitivity to this in some quarters, certain subfields of sociology including the sociology of work often fail to situate their research sites within their larger sociospatial context. For work in particular, there are trends within firms to work remotely or work in re-conceptualized office spaces that are meant to foster creatively. Collectively, firms also seek to locate themselves in innovation centers (Storper 2013). They may do so for many reasons, but the desire to locate in Silicon Valley, Boston’s Route 128 corridor, or downtown Manhattan has implications for their employees’ relationships with firms and with work itself. A greater attention to the way spatial context shapes work of all stripes, not just social and health services work in cities, is necessary.

**The Social Production of Stigmas**

In the previous section, a major contradiction within urban EMS work was further discussed - the EMS system is premised on acute care but routinely responds to what at perhaps better described as “everyday health crises” (Prener and Lincoln forthcoming). Providers’ frustrations with these calls are the result of what I characterized as “intersectional stigmas” involving negative opinions about a range of social and medical problems, including mental illness, substance use and abuse, and homelessness. These frustrations are important in their own right, since provider frustrations can impact the quality of care delivered (Glisson and Durick 1988; Glisson and Hemmelgarn 1998; Glisson and James 1992). They are also important, however, because they provide a mediating link between place and individual-level health outcomes that helps explain the ways in which the EMS system affects patients.

**Shared Perceptions and Occupational Community**

This project describes three sets of perceptions that are held by providers: (1) perceptions about the work that they do, (2) perceptions about the people they work with, and (3)
perceptions about where that work takes place. The data presented throughout CHAPTERS 5 through 8 suggest that these perceptions are widely shared among Private Ambulance’s Emergency Medical Technicians and Paramedics. These perceptions cannot be explained by prior experience - many of the Private Ambulance providers who participated in this study had not worked elsewhere, and had not been exposed to Chapman for any significant period of time before beginning their employment at Private Ambulance. These perceptions, then, are generated by providers' on-the-job experiences and their interactions with colleagues.

In CHAPTER 6, the discussion of socializing and community centered around the spatial constraints on these activities. Despite the spatially diffuse nature of downtime and the physical constraints that come from limited access to parking in "front stage" areas of the city, providers do build a network of relationships with their coworkers. They do this through both chance and planned meetings during shifts, and the use of smartphones for staying connected when meeting up is not possible. These interactions are not purely social, however, since they serve to transmit and reinforce knowledge about downtime, such as the example from CHAPTER 6 when the quality of public bathrooms was the subject of lengthy discussion. Emergency calls are also discussed during downtime, with providers updating each other on the "frequent fliers" they have recently seen, and calls they have recently been on.

This transmission and reinforcement of knowledge is part of the broader occupational community that exists among EMS providers at Private Ambulance. At its core, the concept of occupational community (Van Maanen and Barley 1984; see CHAPTER 2, pp. 39-41 for more discussion) describes the ways in which shared norms, practices, and standards become accepted and reinforced among individuals in the same line of work. At Private Ambulance, the perceptions of patients and neighborhoods discussed throughout the preceding chapters are not reflections of idiosyncratic beliefs or past experiences. These views are also not idiosyncratic to Private Ambulance as an organization. Rather, they are part of the fabric of EMS work in the United States. The focus of the Institute of Medicine’s report on EMS (2007a), which was heavily oriented toward critical care and trauma care, is one example of the larger orientation of
EMS work in the U.S. Providers’ conceptions of “grunt work” and “appropriate use” are therefore widespread constructs that are not specific to individuals or to Private Ambulance. This widespread nature of their perceptions makes Van Maanen and Barley’s (1984) conception of “occupational communities” particularly useful for understanding the diffusion of shared perceptions among EMS providers.

**Appropriate Use of EMS Services and Institutional Stigma**

The contradictions between the EMS system as it is conceived and the reality of urban EMS work are nowhere more apparent than with two groups of patients - the most critical patients and the least. The reality of urban EMS is that another group of patients are the defining clinical population. These patients are defined by providers at Private Ambulance as "bullshit" calls or as "abusers" of the system. No example illustrates the occupation-wide nature of this orientation than a still-active public information campaign in Lake County, Florida. The county public health and EMS agencies launched a public information campaign (see FIGURE 9.2, p. 327) in 2007 that included billboards and a website named "When to Call 9-1-1" (Journal of Emergency Medical Services 2007). Among other things, the website discouraged calling 9-1-1 for "emotional upsets" (no further definition given).

At its core, the divide between so-called “critical” and “bullshit” patients is a debate within Private Ambulance and the larger EMS community over what is an appropriate use of a medical service. From a sociological perspective, providers’ definitions of appropriate service use (e.g. Roth 1972) and patient labels (Brown 1989; Leiderman and Grisso 1985; Jeffery 1979; Shem [1978] 2010) are critical aspects of how providers frame their interactions with patients. These pre-existing conceptions of what appropriate use is, and who embodies that definition of appropriate use, may also have broader influences on how providers view their work and the satisfaction they take from that work (Glisson and Durick 1988; Glisson and Hemmelgarn 1998; Glisson and James 1992).

Like other health care providers, appropriate use of services EMS is a social construct where
definitions are shared and reinforced through the everyday discursive practices of EMS providers. At Private Ambulance, these include both downtime conversations with colleagues, seeing known patients in the Emergency Department while there on an unrelated call or errand, or treating patients they believe to using the EMS system for “bullshit” reasons. As CHAPTERS 7 and 9 illustrated, providers’ definitions of “grunt” or “bullshit” work cannot be disentangled from their stigmatized views about particular health and social problems. CHAPTER 7’s discussion of how psychiatric calls are framed by the Medical Priority Dispatch System, as well as examples like the Lake County public information campaign (see above), also point to institutionalized stigmas (Corrigan and Kleinlein 2007; Pescosolido et al. 2008) within the EMS system.

There have been theoretical attempts to link these varying levels at which stigma may operate, such as Pescosolido and colleagues’ Framework Integrating Normative Influence on Stigma (FINIS; Pescosolido et al. 2008). Within the context of Private Ambulance, it appears that the stigmatized views at the level of the provider are both reinforced by and reinforce the wider orientation of the agency. The FINIS refers to these connections as the “Treatment System”, which links labels to individual responses to a variety of system-level factors such as treatment modalities and institutional policies. In the case of Chapman, “1-37Ds” and “frequent fliers” generate responses from providers that are situated into a wider institutional context where a set of mental, behavioral, and social issues are generally stigmatized. The FINIS points to the fact that this occurs over patients’ illnesses careers and life courses, which is an important point given the repeated interactions that providers report with a subset of the patients who appeared most stigmatized. Private Ambulance, and the wider EMS system, appear to embody much of the process theorized by Pescosolido and colleagues’ FINIS model of stigma (2008).

Spatializing Stigma

CHAPTER 8, however, moves beyond the stigmas of mental illness, substance use, and homelessness. In it, I argue that these stigmas of illnesses and social issues become intrinsically
associated with particular neighborhoods (in the case of Chapman, it is Midtown). This provides empirical evidence for the phenomenon of neighborhood stigma, something that Besbris and colleagues (2015) have only recently established as an empirical phenomenon separate from previous work that theorized the existence of spatial stigmas. My findings suggest that one way in which neighborhood stigmas may be produced are from the explicit spatialization and aggregation of individual traits. On a micro level, Bourgois and Schonberg (2009) described a small group of homeless men living in San Francisco as a “community of addicted bodies”. In Chapman, EMS providers treat Midtown as a neighborhood of homeless, addicted, and stigmatized bodies. Providers’ perceptions are further reinforced by responses to the physical condition of the neighborhood; as one provider described it, Midtown was simply “dirty”.

Neighborhood perceptions, then, may reflect both aggregated individual characteristics and perceptions of the wider physical state of the community. These two groups of traits and responses by EMS providers (or civic service providers more generally) result in the marking and labeling of neighborhoods as “bad”, “dirty”, “dangerous”, and so-on. By articulating the roots of neighborhood stigma in this way, explicit parallels are made between the sociological literature on mental illness and stigma (and in particular the FINIS model; see Pescosolido et al. 2008) and the concept of neighborhood stigma. Indeed, by swapping the “treatment system” for “civic institutions”, the FINIS model may prove useful for theorizing and framing the ways in which neighborhood stigmas are constructed and responded to by inter-neighborhood institutions. Many of the constituent characteristics of both the individual and the community that Pescosolido and her colleagues describe - the social psychological context and social characteristics of individuals and media and national contexts of the community - could readily be applied to questions of neighborhood stigma.

For EMS providers in Chapman, the existence of this spatial stigma is the key connection between place and individual health outcomes. The so-called “mediational model” described in CHAPTER 2 emphasizes the need to seek out mechanisms that can connect individuals to place in ways that produce disparate health outcomes. At Private Ambulance, it is providers’
stigmatized orientations to particular illnesses and patients are explicitly situated within neighborhoods. These are views that do not exist in a vacuum but are part of a larger institutional orientation toward the issues of substance use, mental illness, and homelessness. Providers’ assumptions about Midtown and the types of calls frame their responses from the moment of dispatch onward and, as CHAPTER 8 illustrated, these frames have consequences for their treatment of patients. Stigma, then, is the driving force behind the ways in which the EMS system mediates the relationship between place and individual health outcomes for patients in Chapman.

**Bridging Institutional and Spatial Fault Lines in Urban EMS**

These various themes have implications for sociology, but also for the way in which EMS services are managed. The EMS system as it currently exists suffers from a number of crucial issues (IOM 2007a): the direction of the continued evolution of the EMS system (should it practice emergency medicine or a more broadly pre-hospital medicine? is it a part of the public health system or is it a first responder institution?), the lack of career advancement opportunities beyond the level of Paramedic, and its integration into the wider health care system. My research in Chapman has led me to a number of policy suggestions that are aimed squarely at these questions as they apply to urban EMS1: (1) integrated medical records, (2) an expansion of patient disposition options, and (3) a repositioning of the EMS system as a full-fledged pre-hospital medical system.

**Improving Integration and Coordination**

A critical point of disjuncture between the EMS system and other institutions both in Chapman and nationally is the way medical records are managed and shared. EMS agencies typically do not share medical record systems with the larger health care system that they

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1 A focus on urban EMS is an important caveat since rural EMS has its own set of challenges and idiosyncrasies (IOM 2007a) that likely deserve their own set of policy interventions.
operate within (Majeed, Stöhr, and Röhrig 2013). Electronic health record (EHR) systems present both fiscal and privacy challenges for adopters (Bates 2005), and there are often interoperability issues between different platforms (Menachemi and Collum 2011). In EMS settings, providers lack pre-existing clinical knowledge about their patients. This includes information about their medical history, allergies, and current medications - all knowledge that could improve patient outcomes if providers had access to such data. Private Ambulance providers also lack access to resources like the list of individuals who are not allowed at the “wet shelter” due to behavioral issues, or the availability of beds in that shelter. This lack of information results in providers standing with patients on the street with individuals while they wait for the Chapman Fire Department dispatchers to contact the shelter and then relay information back to the ambulance crew.

The “wet shelter” also has clinicians that are available at certain times for their residents. A patient could therefore be treated at the “wet shelter”, where a provider determines that further treatment or testing is required at the hospital. This then requires contacting Private Ambulance for transport to the Mather Hospital’s Emergency Department. At each stage in this chain, different record keeping systems are used and there are opportunities for information to be confused or lost in the process. These also represent discrete stages in care, each of which exists with little to no coordination with the other institutions. These are wider issues for health care and electronic health records (Rudin and Bates 2014), where the promise of integration and coordination has yet to be fully realized. Integrated electronic health records are one part of the larger, complex coordinated care puzzle in the United States (Bodenheimer 2008), and reducing the barriers to EMS providers’ participating in such care should be a priority for policy makers.

**Expanding Disposition Options**

Beyond the lack of coordination with other health care institutions, EMS providers in Chapman and their patients lack options for patient disposition. Since the wider EMS system is premised on acute care, it is designed as a funnel into Emergency Departments. Medical care in
EDs is expensive (Lee, Schurr, and Zink 2013), EDs in cities often suffer from overcrowding (IOM 2007b), and many patients could be better served by seeking care at an urgent care center, a "retail clinic", or at their primary care physician's office (Weinick, Burns, and Mehrotra 2010). These facilities, however, are not disposition options for EMS providers. Patients may either be left at the scene to make their own way to the hospital (or if additional care is not required), transported to the ED, or, in some cases, alternate transport to a homeless shelter may be arranged. This third option does not exist in many cities, where EMS agencies are confined to the first two disposition outcomes. For specific populations, such as Chapman’s street homeless, there is not a sub-acute option for patients requiring some level of care but who do not require the resources available in an ED. For patients with psychiatric needs, they cannot be taken directly to psychiatric facilities but must be 'cleared' by a psychiatric emergency room before being transported a second time by EMS providers to a more appropriate facility (Prener and Lincoln forthcoming). Expanding the options that EMS providers have, whether it is to existing institutions (homeless shelters, psychiatric hospitals, urgent care centers, or neighborhood clinics) or to new types of facilities designed to offer sub-acute care to vulnerable patient populations could limit ED overcrowding, improve patient outcomes, and decrease the cost of providing patient care.

Transforming EMS into Pre-hospital Medicine

Beyond the lack of options, EMS providers’ hands are tied by regulations that date to the EMS system’s earliest days that were characterized by disorganization and the amateur status of EMS providers (Metz 1981; Whalley and Barley 1997). While providers’ clinical skills have increased greatly, the regulatory framework within which they operate has often lagged behind (IOM 2007a). A transition from providing acute care to a genuine pre-hospital medical system that captures the reality of urban EMS work would involve a fundamental shift in the way the EMS system is conceptualized and managed.

These changes are already beginning to happen in some localities but have failed to gain
widespread traction within the EMS community. All small number of cities, including Raleigh-Durham, North Carolina and Fort Worth, Texas, have instituted programs designed to address the "frequent fliers" phenomenon that go beyond billboards and websites that admonish patients for calling 9-1-1. These programs utilize Paramedics with advanced training (often known as Advanced Practice Paramedics) to work with patients who are at a high risk of hospital readmission. Another program in Mesa, Arizona utilizes Physician Assistants (PAs) who are paired with Paramedics. The PAs have the ability to suture, provide some medications to patients, and write prescriptions. They also have the ability to "medically clear" patients who need psychiatric care or detoxification services, allowing these patients to bypass the Emergency Department and be transported directly to psychiatric or detox facilities. Of the three programs, the Arizona program comes closest to an acknowledgement that “bullshit” patients are a fundamental aspect of EMS work despite the program’s limited scope.

A true acknowledgement of the reality of urban EMS would require EMS agencies to abandon a passive approach to “bullshit” patients that continues to allow these patients to cycle repeatedly through the EMS and ED systems and also to abandon efforts like Lake County's "When to Call 9-1-1" program. Instead, efforts like Mesa, Arizona's program should be expanded. This would involve deepening Paramedics' scope of practice, allowing Paramedics with additional training to do much of the work that Physician's Assistants are doing in Mesa currently. This also involves re-conceptualizing the role of EMS agencies from providers of acute care to providers of a broad spectrum of pre-hospital medicine.

Limitations

Research Site Specific Features

Each of the research sites (the City of Chapman and Private Ambulance) have features about them that, while not unique, do potentially limit the generalizability of the research findings presented here. The City, to begin with, is smaller than the cities typically studied in the urban sociology literature. There is a bias within urban sociology toward the largest cities in the United
States, and Chicago in particular. Allard and Small (2013) argue that this is due to the legacy of the Chicago School and the University of Chicago in framing the city of Chicago as the ideal laboratory for urban research. Whatever the reason, it is clear that Chicago and, to a slightly lesser extent, New York and Los Angeles have had a large if not outsize influence on the urban sociology literature. That I focus on a much smaller but still very urban city could in this context be seen as both a strength and a limitation.

Whatever your orientation, it does have implications for the generalizability of the findings. As I noted in the section ‘Spatial Context’ (see this chapter, pp. 207-210), Chapman lacks the marked ‘ghetto’ areas that are more common in the aforementioned cities and that have seen so much focus in urban sociology. Providers’ responses to deeply entrenched, racially segregated poverty are thus left out of this dissertation. I do not believe the EMS system (or any institution for that matter) is immune to these issues, only that they are not particularly salient issues for Private Ambulance. Nevertheless it is an issue I am sensitive to and one that I hope to address with future research.

There are also characteristics of Private Ambulance that may limit the generalizability of these findings. To begin, Private Ambulance, like its name implies, is not a city-owned enterprise. There are a number of dominant models for delivering urban EMS care: (1) fire department based services, (2) public ‘third’ services that are stand-alone organizations, (3) hospital-based services, and (4) privately owned services. The ways in which providers understand and relate to urban communities may be mediated by the type of service they represent. For instance, many fire department services (including for example the Chapman Fire Department) are civil service organizations that have residency requirements to be eligible for testing. Hospital-based services may have a closer affinity to a model of EMS that is more public or community health oriented. Thus while I argue that there are occupational norms that cut across EMS as a whole (see this chapter, pp. 211-212), organizational context and firm-level effects cannot be ignored.
Data Limitations

In addition to these research site limitations, there are limitations with the data used in these analyses. The first of these limitations involves the sketch map data. As described in CHAPTER 3 (p. 61), providers’ sketch map clusters were entered into the data warehouse manually. If a cluster touched a Census Block Group (CBG), that CBG was coded as a ‘1’ in the database; if it did not, the CBG was coded as ‘0’. This approach had the effect of widening the boundaries of a given sketch map cluster, since even the smallest touch of a CBG boundaries was enough to have it included in a cluster. In the analyses of Midtown (see FIGURE 8.1, p. 319), the CBG that is shown protruding to the west (left) of the neighborhood is noise from this approach. It is a long, thin CBG that stretches from Midtown Plaza far to the west, crossing three of Chapman’s neighborhoods. The apparent emphasis on this CBG (one of nine identified as part of Midtown; see CHAPTER 8, pp. 177-178) is likely noise rather than signal. More robust ways of digitizing sketch map data exist, but would still require integration with census data if demographic factors are to be controlled for. Alternatively, Census Block data could be used, but would limit the range of characteristics that could be accounted for in analyses. As of now, there is no ideal system for perfectly integrating qualitative sketch map data with quantitative data that is bounded by hard administrative boundaries.

The second limitation, the sensitivity and specificity of Medical Priority Dispatch System (MPDS) data, is an important one. The “objective” measures of EMS demand rely on these codes (see APPENDIX E, pp. 376-379) to identify different type of calls. Sensitivity and specificity are concepts from epidemiology and biostatistics that respectively refer to the “true positive rate” (i.e. people correctly identified as sick) and “true negative rate” (i.e. people correctly identified as not sick) of medical tests (Altman and Bland 1994). Assessments of the MPDS (Feldman et al. 2006; Flynn, Archer, and Morgans 2006) have found that individual codes have greatly varying rates of sensitivity and specificity, with almost half of the protocols having sensitivities that were less than 50% (Feldman et al. 2006:959). The sensitivity and specificity values for the four MPDS codes used in CHAPTER 7 are given in TABLE 9.3 (see p. 328). In
Feldman et al. (2006), the MPDS protocols for Unconscious patients (MPDS Protocol 31) and Overdose/Poisoning (MPDS Protocol 23) performed poorly while the Psychiatric/Suicide (MPDS Protocol 25) and the Unknown/Man Down (MPDS Protocol 32) performed well. The skills of the 9-1-1 call takers likely contribute to the accuracy of these protocols, so variation between 9-1-1 centers is to be expected (Feldman et al. 2006:960). While it is possible that Chapman’s 9-1-1 call takers are more skilled than those reported by Feldman and colleagues (2006), and there is only a limited literature on the accuracy of the MPDS system, the accuracy of the MPDS is a limitation of this study (see APPENDIX E, pp. 376-379 for more details).

One way to mitigate the accuracy of the MPDS data is through the use of patient-level datasets. The lack of these data, which I had planned to access but was unable to do so do to a lengthy Institutional Review Board process, is the third major data limitation of this study. Patient-level data would open up a number of analytical possibilities, including hypothesis testing around questions related to the impact that the identified stigmas and biases has on patient care indicators. Using patient-level data would eliminate the limitation of using police calls for service data (see CHAPTER 3, p. 62) as a proxy for EMS demand. In Chapman, the presence of multiple jurisdictions and other avenues for requesting EMS resources outside of the 9-1-1 system mean that the Chapman Police Data do not provide a complete picture of EMS demand. While they do provide a good starting place, there are likely areas of the city where the CPD data underestimate EMS demand because another police department has primary jurisdiction (such as on university campuses). Finally, without patient-level data, it is impossible to fully assess the degree to which the social constructs described in this study impact patients’ health.

**Analytical Limitations**

In addition to these data limitations, there are a number of statistical limitations as well. The first follows directly from the previous data limitations - the lack of patient level data. Since this data was unavailable for analyses, the sample size was limited to the approximately ninety
Census Block Groups (CBGs) in the City of Chapman. At small sample sizes there is a risk of “overfitting” regression models by including too many independent variables, which can produce inaccurate results (Babyak 2004; Green 1991; Harrell 2001). Rules of thumb vary on the definition of “too many” variables, with one common approach being to use ten to fifteen percent of the sample size as a cutoff (Babyak 2004). In this study, models would therefore need to be restricted to between nine and thirteen independent variables. In order to reduce the chance of errors, scales were used in both CHAPTER 7 (see p. 171) and CHAPTER 8 (see pp. 181-183) to circumnavigate these limitations. Having patient-level predictors would greatly increase the sample size and render these specific concerns moot. They would also allow for the use of geographically weighted regression models, which require larger sample sizes than the current number of CBGs allows (Devkota, Hatfield, and Chintala 2014; Páez, Farber, and Wheeler 2011).

The use of scales to overcome limits to the number of independent variables produces a second statistical limitation that should be noted. Though not considered one of the fundamental assumptions Cronbach’s alpha, normality may have a impact on results produced using the procedure. Non-normal data may serve to inflate calculations of Cronbach’s alpha, producing values for alpha that overate the reliability of the scale constructed (Sheng and Sheng 2012; Bay 1973). Though there are also studies that show that alpha is robust to non-normal distributions (Zimmerman, Zumbo, and Lalonde 1993), the lack of clear evidence of robustness leads me to suggest that the scales used in both CHAPTER 7 (see p. 171) and 8 (see pp. 181-183) should be treated with some caution. In order to mitigate some of the possible issues with the scales due to normality, I eliminated variables from consideration if the Spearman’s rho correlation values indicated substantially weaker relationships between variables than the inter-item correlations otherwise suggested. Nevertheless, this may only partially mitigate these issues and thus normality presents a second statistical limitation of these data.

The final limitation to be discussed is the problem of spatial autocorrelation in these data. In the preceding chapters, measures of spatial autocorrelation (Moran’s I, the Empirical Bayes
variation of Moran’s $I$, and the Moran’s $I$ bivariate scatterplots) were used to identify clustering in that data in support of the argument that EMS work is spatially patterned in meaningful ways. Autocorrelation in spatial data, however, is also a statistical challenge because it may result in an underestimate of the amount of variance in a given sampling distribution (Haining 2009). This can have implications for inferences made using conventional linear statistics because the risk of Type I Error (rejecting the null hypothesis by mistake) increases with spatial autocorrelation. The inferences made based on the statistics presented in the following tables are therefore subject to an important limitation - one component of the error present in these models is the degree to which spatial autocorrelation introduces bias. The rates of spatial autocorrelation for key variables are found in the tables in both CHAPTERS 5 (see pp. 98-99) and 7 (see p. 161) and, while none appear particularly strong, there are statistically significant, positive Moran’s $I$ values for all variables. Spatial autocorrelation may therefore influence the regression models and caution should be used in interpreting the models’ results. In particular, spatial autocorrelation may be responsible for the limitations with residuals found in the OLS regression models in CHAPTER 8 (see pp. 182-183). A larger sample size (see above) would allow for the use of geographically weighted regression that, while it would increase the analytical sophistication of this project, would also help to address spatial autocorrelation.

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One of the strengths of the mixed methods approach used here is that mixing methods can help to overcome the limitations of individual methodologies. Therefore, despite limits to both the data and the statistical analysis, the findings presented here are the result of the convergence of results from multiple different forms of analyses: qualitative, statistical, GIS, and spatial statistical. This convergence (or “triangulation” as it is sometimes termed in the mixed methods literature) can help compensate for issues present in one aspect of the data analysis or another, and it gives me greater confidence in assessing the validity of my findings. The EMS system
reflects important facets of how cities and health care institutions are organized at the same time that it helps to shape and transform those same social structures. The experiences of Private Ambulance’s providers speak to the importance of understanding stigma as a feature of health care and social services systems, and the ways in which stigma can alter the interactions that patients and clients have with these organizations. These findings are critically important for building upon the existing foundation of the EMS system and transforming it into a more robust, well rounded, and responsive pre-hospital medical system. They are also the basis of what I hope will be further inquiry and analysis into pre-hospital medicine for my own career. These future directions, along with an assessment of the wider sociological contributions of this study, are the subjects of the next and final chapter.
CHAPTER 10: Conclusion

The findings summarized in CHAPTER 9 represent the culmination of over six years of research spanning two projects. The first, a pilot study of EMS work conducted in 2009, was used to assess the feasibility of a dissertation on EMS work and identify critical areas for future focus. This dissertation, begun several years later, took up several of those critical areas. In this final chapter, I assess the major contributions of this research effort and suggest a number of possible future research directions that build upon these contributions in new ways.

Contributions

Spatializing Stigmas

Of the research findings presented in the preceding chapters, the connection between stigmas at the individual level and a wider spatial stigma is the one that I believe is most notable. Stigma has traditionally been the domain of the sociology of mental health and illness, rooted as it is in Goffman’s (1963) still seminal monograph. Much of the stigma literature has analyzed the effect of stigma on individuals’ experiences with the mental health care system
without thinking about the wider consequences of a community of stigmatized bodies. In urban sociology, however, it is only recently that serious empirical efforts to understand the effect of stigmas at the neighborhood or community level have begun.

Not only does this project connect those two wider efforts, but it does so while arguing that the mediating effect that EMS providers have between place and individual health outcomes lies in the ways stigma negatively influences interactions between providers and patients. This influence of stigma arises out of the association of intersecting individual stigmas with a wider neighborhood followed by the application of that spatial stigma broadly to other patients. I believe that there is much potential in extending the deep theoretical understandings of stigma in the mental health literature to urban social problems. Pescosolido and colleagues’ FINIS (2008), discussed in the previous chapter, appears to be an exciting avenue for such an effort because it already explicitly acknowledges the importance of community-level factors.

Work, Institutions, and Place

The search for the specific community-level factors that serve as pathways connecting place to individual outcomes will no doubt identify other inter-neighborhood institutions and workplaces. For the sociology of work, there is not only a need to better understand the impact of place and space on work but also a need to understand how work regimes shape neighborhoods. Work involves inherent spatial features, whether is the importance of a particular neighborhood for making connections between firms, the role of place in structuring commutes, or the experience of traveling across a city as part of the workday. It is almost cliché to speak of “spatial turns” in various disciplines, but I believe that there is an intellectual need for the role of neighborhood and place to have a more prominent position in the sociology of work. Such a need becomes all the more important as shifts in the organization of work continue to take place. As I have previously noted, areas like innovation spaces and communal work areas challenge the notions we hold about what an office can look like. Such a reorganization of workplaces, however, may also challenge the way work itself is approached and understood by
employees. A great attention to space and place therefore matters not just for where offices are located but also how they are physically organized. This project represents a first step in that regard.

GIS and Mixed Methods Field Work

The findings that generated these contributions would not have been possible without the mixed methods research design that was employed here. Of the various elements of this research design, the most novel were the inclusion of qualitative GIS data collection strategies that utilized mobile devices for data collections. The ability to collect spatial data in the field easily and in ways that assured the protection and privacy of my research participants and their patients is itself a major methodological contribution to the literature on mobile data collection. While their use is both novel and exciting, I do not see these devices replacing long form, qualitative field notes. Rather, I believe that with the right software and hardware, there is significant potential for mobile devices to extend qualitative fieldwork and enable a wide variety of mixed method applications. These applications offer a number of untapped areas of potential for researchers beyond their use here. With mobile databases, there are few limits to the type of data collected so long as data storage and analysis structures capable of handling complex data are employed.

The ability to collect geocoded spatial data using mobile devices allows for a range of data to be analyzed spatially using GIS software as well as spatial statistics. The ability to map qualitative data in GIS applications has existed for some time, but the analysis of these data using spatial statistics is relatively novel with this study among the only documented efforts to do so. Far more qualitative GIS studies rely on relatively superficial analyses of spatial data. Thus, while there are strong quantitative and qualitative traditions within geography and geographic information science, there is a much weaker body of work that mixes these approaches. There are both practical and epistemological reasons for this, but the potential benefits of more rigorous analyses and an increased ability to draw inferences from sketch map
data make pursuing mixed methods analyses worthwhile. Much of this ability comes down to
decisions made about the type of sketch map data collected. Using a cartographically accurate
basemap, for example, made the collection and digitization of structured interview data easier.
Even with the decision to aggregate observations to the Census Block Group, it was still possible
to perform statistical cluster analyses, meaning that there are a range of options for researchers
regardless of the specific type of spatial data collected.

GIS in Sociological Mixed Methods Research

Taking these GIS and spatial statistical techniques from geography and using them in
sociological research is also relatively new, with comparatively few researchers employing these
techniques in sociological work (Logan 2012; Spain 2014). One challenge to the adoption of
these techniques, particularly in qualitative research settings, is the identifiable nature of GIS
data. The norm for researchers using qualitative GIS has been to publish maps generated during
data collection, some of which may include detailed information about participants’ residences,
work locations, and daily habits. For example, a map published by Boschman and Cubbon
(2014) in their review of the sketch map literature contains residence, work, and travel route
data for a respondent in Columbus, Ohio. This tradeoff, which places cartographical accuracy
above the potential for re-identifying participants, may be uncomfortable for qualitative
sociologists who are used to keeping research locations and other identifying information
confidential.

My novel approach, which I called “alternative cartography”, allows for the display of spatial
data without compromising the anonymity of the research sites. In designing the map of
Chapman used for this project, I attempted to preserve as much of the relative positioning and
size of the Census Block Groups as possible. The large quantity of spatial data collected across
this project was therefore able to be shared in ways that would have not been possible given the
human subjects constraints of doing research in emergency health care settings. More generally,
it is worth repeating that GIS approaches, whether qualitative or quantitative, offer a wide range
of options for sociologists whose research has spatial components. Using these approaches is not necessarily incompatible with human subjects constraints so long as researchers are open to creative solutions regarding how spatial data is collected, stored, analyzed, and disseminated.

**Future Research**

These substantive methodological approaches involving mobile data collection, GIS techniques, and mixed methods research designs are ones that I intend to carry forward as I continue analyzing data collected for this dissertation and extend the ideas described here in new directions. These research findings suggest that place matters in important ways for EMS work. Understanding and quantifying these effects through the use of patient data and travel route data are two ways in which I intend to extend the findings presented here by continuing to use these data for new analyses. These utilize novel forms of data that may continue to produce methodological as well as substantive contributions. I am also excited about possible new directions suggested by these data, including the role that larger, concentrated areas of urban deprivation and poverty have in shaping first responder work. The limited discussion of opioid overdoses also begs for further analyses because of the ways in which their treatment in pre-hospital settings differs from other types of overdoses as well as the growing perception that opioid overdoses are on the rise.

***

These new research projects build off the core findings from this dissertation, which focus on the ways in which context shapes Emergency Medical Services work in urban areas. This impact extends to both emergency calls that providers respond to and to downtime activities - the temporal space between calls that providers fill with a variety of errands, tasks, and socializing. In Chapman, the city that Private Ambulance serves, these downtime events occur largely in areas I describe as “focal points”, which can broadly be divided into both public (“front stage”)
and private (“backstage”) areas of the city. In front stage areas, providers’ presence generated conflict with local business owners who had a different notion of who had a “right” to occupy the space on the street near their business. This conflict pushed providers out of a core area of the “Old Quarter” neighborhood, a change that reshaped much of their downtime activities. These changes speak both to the ways in which the use urban space is socially constructed and the impact that urban space can have on workers who routinely use it as part of their work routines.

Space also matters for the calls providers respond to themselves, which are focused on particular parts of the city. Providers’ interpretations of this focus have much to do with the groups of patients that they believe that they see on a regular basis - patients they label as “frequent fliers” and “1-37Ds”. These patients are often stigmatized by both the general public and also by EMS providers, who characterize their work with them as “grunt work” or worse. Their focus on these populations drives their perceptions of where EMS work occurs, causing them to overestimate the burden of this work in certain neighborhoods. Much of this work, providers believe, is non- or sub-acute work that falls outside of the EMS system’s mandate to provide acute medical care. It is also repetitive work, since these patients are seen regularly by providers during calls and even during downtime drives through the Midtown neighborhood. This disconnect between the formal mandate of the system and the everyday reality of urban EMS work represents a key policy challenge for EMS agencies, who can either choose to allow this tension to simmer or begin to reshape their services to better match the clinical realities of their work.

In Chapman, a particular neighborhood stood out above all others for its perceived concentration of these stigmatized patients. This generated another stigma, this time a neighborhood one, that providers described regularly. The production of neighborhood stigma shapes their impressions of calls even before they arrive on-scene, and provides a unique view of the ways in which social psychological impressions of place are generated and reinforced. Understanding how inter-neighborhood institutions, particularly those that provide civil services, respond to different neighborhoods may help to elucidate the variations that are often
observed between different neighborhoods. The stigmas that these different institutions hold are thus important both for our understanding of how and why differences between neighborhoods emerge, but also for policy efforts that attempt to ameliorate those differences.


References


Henckes, N. and M Nurok. Forthcoming. “The first pulse you take is your own’ – but don’t forget your colleagues’. Emotion teamwork in pre-hospital emergency medical services.” *Sociology of Health & Illness*.
References


References


TABLES & FIGURES
FIGURE 1.1 - Ambulance at Cabrini Green

Source: David Schalliol (http://davidschalliol.com); photo used with permission
FIGURE 2.1 - Sociospatial Model of EMS Work
FIGURE 2.2 - Sociology of Work Time Model

Temporal Context \[\rightarrow\] Social Context

\[\text{Interdependent Work Patterns}\]

Source: Adapted from Perlow (1999)
<table>
<thead>
<tr>
<th>Question</th>
<th>Research Question</th>
<th>Research Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1</td>
<td>Explain the ways in which neighborhood conditions and context influences the daily work routines of providers.</td>
<td>- Field observations, including GIS mapping of fieldnote locations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Semi-structured interviews</td>
</tr>
<tr>
<td>Question 2</td>
<td>Describe the ways in which dispatch information and providers’ subjective frames inform impressions of particular calls before EMS providers arrive on-scene.</td>
<td>- Field observations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Semi-structured interviews</td>
</tr>
<tr>
<td>Question 3</td>
<td>Identify the types of work, focusing on non-medical “street level social work” that EMS providers engage in and describe the neighborhood conditions and context within which this work occurs.</td>
<td>- Field observations, Semi-structured interviews, including quantitative and GIS analyses of sketch map data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Calls for service data</td>
</tr>
<tr>
<td>Question 4</td>
<td>Evaluate the spatial patterning of EMS calls and the effect that social and neighborhood conditions have on this process.</td>
<td>- Calls for service data</td>
</tr>
</tbody>
</table>
FIGURE 3.2 - Research Design

Notes: Design based on Morse (2010)
Inset A. High contrast design of basemaps used for data collection that included Chapman’s street grid (in gray), Census Block Group boundaries (in red), and landmarks familiar to EMS providers.

Inset B. Other landmarks included on the basemap.

- Ambulance Base
- Police Station
- Fire Stations
- Transit Stations
- Hospitals

Notes:
- Inset A map fabricated for use in public presentations
- Basemap was used to collect data during interviews; these maps are typically reproduced in Qualitative GIS publications
- Basemaps were printed in color and in large format (11" x 17")
- Basemaps also included prominent water features in blue
FIGURE 3.4 - FieldWerks Screenshots

Inset A. Fieldnote window

Inset B. Spatial data associated with fieldnote and displayed on interactive map

Inset C. Image associated with fieldnote

Notes:
- The audio feature was not used for this project
- Data in images are test data collected for use in public presentations
TABLE 3.5 - EMS Shift Observations Summary

<table>
<thead>
<tr>
<th>Shifts by Day of Week</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>2</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Monday</td>
<td>3</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Tuesday</td>
<td>2</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Wednesday</td>
<td>3</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>Thursday</td>
<td>3</td>
<td>15</td>
<td>65</td>
</tr>
<tr>
<td>Friday</td>
<td>3</td>
<td>15</td>
<td>80</td>
</tr>
<tr>
<td>Saturday</td>
<td>4</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shifts by Type of Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekend</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>Weekday</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shifts by Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>August</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>September</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>October</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>November</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>December</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
FIGURE 3.6 - EMS Shift Observations Summary

Notes:
- Shifts ordered based on type (ALS, BLS, or both) and then by the randomly assigned shift identification number
- Density graph refers to the frequency with which observations covered a particular hour
- Arrow at the end of shift means that the end time for observations occurred the following morning
FIGURE 3.7 - Google Maps Web Application Screenshots

Inset A. Overview of Boston Census geography for Back Bay, Fenway, and part of Roxbury.

Inset B. Zoomed-in view of current location lined up with Census geography polygons.

Inset C. Embedded Census geography identification number, obtained by tapping on the desired polygon.

Notes:
- Data in images are test data collected for use in public presentations
- The Census geography depicted is at the Census Tract level; an identical process was used in Chapman with Census Block Groups
FIGURE 3.8 - myTracks Application Screenshots

Inset A. Overview of travel route between two points in the Boston area

Inset B. Zoomed-in view of the beginning of the travel route showing ‘dirty’ data due to poor cellular service

Inset C. Zoomed-in view of the end of the travel route showing cleaner data in an area with better service

Notes:
- Data in images are test data collected for use in public presentations
- Images B and C show differences in data quality depending on the quality of cellular service; data transcription was used largely for human subjects reasons but had the added benefit of controlling for data quality issues in the raw data
FIGURE 3.9 - Sketch Mapping - Participant Data

Inset A. Fictious participant data for two clusters.

Large circle: Fictious cluster representing an area where a provider felt they responded to calls on a regular basis. This was the first cluster they identified for that prompt, and would have been labeled as “fx1” in red ink as in FIGURE 3.11.

Small oval: Fictious cluster representing an area where a provider felt they responded to substance use calls on a regular basis. This was the second cluster they identified for that prompt, and would have been labeled as “s2” in green ink as in FIGURE 3.11.

Notes: Data in images are test data fabricated for use in public presentations
FIGURE 3.10 - Sketch Mapping - Interviewer Annotations

Inset A. Fictitious annotations for two clusters - “fx1” for the first cluster identified for frequent responses and “s2” for the second cluster identified for substance use responses.

Inset B. Legend for annotations types used. Each annotation also included a number indicating the order in which it was identified by the respondent (see Inset A).

**Blue Ink**
set of symbols - downtime clusters

**Red Ink**
fx - frequent response clusters
fxA - areas providers mentioned after viewing map of where I went to calls during the EMS shift observations

**Green Ink**
h - homeless call clusters
s - substance use call clusters
p - “psych call” clusters
n - “non-acute” call clusters
c - chronic illness call clusters

*Notes:* Data in images are test data fabricated for use in public presentations.
Inset A. Fictitious annotations for one cluster - “fx1” for the first cluster identified for frequent responses; this is the same “fx1” cluster identified in FIGURE 3.x and FIGURE 3.11.

Inset B. Fictitious database entries for the same cluster. A database record (analogous to a spreadsheet row) was created for each cluster. Block Groups included in the cluster were coded with a “1” if the checkbox was marked and were coded with a “0” if it was not.

Notes: Data in images are test data fabricated for use in public presentations
FIGURE 3.12 - Alternative Cartography Transformation

Inset A. Original Census geography unit with an area of 430,050.

Inset B. Convert area to points by dividing by 100, then use (length*width) to calculate the area of the alternative cartography unit. In this case, it is a rectangle that is 50pt by 86pt in size.
Inset A. Full alternative cartography map consists of Block Group polygons placed together so that the relative position of the actual Census geography is preserved. Inset shows alternative cartography for East Chapman.
FIGURE 4.1 - Percent Non-white Residents per Census Block Group

Notes:
- Categories selected using the Jenks (1967) natural breaks optimization technique.
- Data are plotted for \( n \approx 90 \) Census Block Groups.

Source: 2008-2013 American Community Survey
FIGURE 4.2 - Per-capita Income per Census Block Group

Notes:
- Categories selected using the Jenks (1967) natural breaks optimization technique.
- Data are plotted for \( n \approx 90 \) Census Block Groups.

Source: 2008-2013 American Community Survey
FIGURE 4.3 - Percent of Residents Below Federal Poverty Line per Census Block Group

Notes:
- Categories selected using the Jenks (1967) natural breaks optimization technique.
- Data are plotted for $n \approx 90$ Census Block Groups.

Source: 2008-2013 American Community Survey
FIGURE 4.4 - Major Landmarks in Chapman
<table>
<thead>
<tr>
<th>Provider Perception</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Largely Negative</td>
<td>2</td>
<td>6.67</td>
<td>6.67</td>
</tr>
<tr>
<td>Mixed</td>
<td>12</td>
<td>40.00</td>
<td>46.67</td>
</tr>
<tr>
<td>Largely Positive</td>
<td>16</td>
<td>53.33</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Perceptions based on qualitative analysis of Chapman related-questions in semi-structured interview transcripts (see CHAPTER 3, pp. 59-61)*
### TABLE 4.6 - Provider Experiences with Chapman

<table>
<thead>
<tr>
<th>Chapman Familiarity</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Familiar</td>
<td>17</td>
<td>56.67</td>
<td>56.67</td>
</tr>
<tr>
<td>Somewhat Familiar</td>
<td>6</td>
<td>20.00</td>
<td>76.67</td>
</tr>
<tr>
<td>Very Familiar</td>
<td>7</td>
<td>23.33</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapman Resident</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>No, Never Has Been</td>
<td>21</td>
<td>70.00</td>
<td>70.00</td>
</tr>
<tr>
<td>No, Has Been in Past</td>
<td>5</td>
<td>16.67</td>
<td>86.67</td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>13.33</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

*Source:* Experiences based on qualitative analysis of Chapman related-questions in semi-structured interview transcripts (see CHAPTER 3, pp. 59-61)
## TABLE 4.7 - Neighborhoods Identified by Providers During Sketch Map Exercise

<table>
<thead>
<tr>
<th>Official Neighborhoods</th>
<th>Providers’ Neighborhoods</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Chapman</td>
<td>Bullhead</td>
</tr>
<tr>
<td>North Lake</td>
<td>North Chapman</td>
</tr>
<tr>
<td>Uptown</td>
<td>Bullhead Pond</td>
</tr>
<tr>
<td>North Lake</td>
<td>Uptown</td>
</tr>
<tr>
<td>South Lake</td>
<td>Uptown Plaza</td>
</tr>
<tr>
<td>Muir Hill</td>
<td>Northwest Chapman</td>
</tr>
<tr>
<td>Palmer</td>
<td>West Chapman</td>
</tr>
<tr>
<td>Goodman Hill</td>
<td>The Old Quarter</td>
</tr>
<tr>
<td>Lower Goodman</td>
<td>Lower Goodman</td>
</tr>
<tr>
<td>Mid-Chapman</td>
<td>Midtown</td>
</tr>
<tr>
<td>Oxford</td>
<td>Tory Plaza</td>
</tr>
<tr>
<td>Fulmore</td>
<td>Fulmore</td>
</tr>
<tr>
<td>Downtown</td>
<td>Downtown</td>
</tr>
<tr>
<td>East Chapman</td>
<td>East Chapman</td>
</tr>
</tbody>
</table>

*Source: Sketch map data that had a neighborhood as the subjective location (n=406; see CHAPTER 3, pp. 59-61).*
TABLE 5.1 - Field Note Frequency by Type and Location

<table>
<thead>
<tr>
<th>Note Type</th>
<th>Frequency</th>
<th>Percent</th>
<th>Within Type Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emergency Calls</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Chapman, valid*</td>
<td>126</td>
<td>26.36%</td>
<td>78.75%</td>
</tr>
<tr>
<td>Within Chapman, invalid**</td>
<td>25</td>
<td>5.23%</td>
<td>15.26%</td>
</tr>
<tr>
<td>Outside of Chapman</td>
<td>9</td>
<td>1.88%</td>
<td>5.62%</td>
</tr>
<tr>
<td><strong>Emergency Calls subtotal</strong></td>
<td>160</td>
<td>33.47%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Downtime Events</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Chapman, valid†</td>
<td>276</td>
<td>57.74%</td>
<td>86.79%</td>
</tr>
<tr>
<td>Within Chapman, invalid‡</td>
<td>32</td>
<td>6.69%</td>
<td>10.06%</td>
</tr>
<tr>
<td>Outside of Chapman</td>
<td>10</td>
<td>2.09%</td>
<td>3.14%</td>
</tr>
<tr>
<td><strong>Downtime Events subtotal</strong></td>
<td>318</td>
<td>66.53%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>478</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**  
* - Emergency calls are valid when patient contact was made  
** - Emergency calls are invalid when no patient contact was made  
† - Downtime events are valid when they included a downtime location  
‡ - Downtime events are invalid when they do not include a downtime location because the ambulance was in transit from one point to another and was dispatched to an emergency call

**Source:** Data drawn from the EMS shift observation phase of data collection (n=20 shifts; t=280 hours). See CHAPTER 3, pp. 56-59 for more details.
FIGURE 5.2 - Choropleth Map of the Distribution of EMS Incidents by Census Block Group, 2011-2013

Notes:
- Moran’s I value for this distribution = 0.1304 (p < .001; APPENDIX E, pp. 376-379 for details on the conceptualization of spatial relationships)
- Categories selected using the Jenks (1967) natural breaks optimization technique.
- Data are plotted for n = 90 Census Block Groups.

Source:
- EMS Incidents per Census Block Group (2011-2013) is derived from the Chapman Police Calls for Service Data (see CHAPTER 3, p. 62 for details) and includes any incident with an accompanying EMD code (see APPENDIX E, pp. 376-379 for details).
FIGURE 5.3 - Scatterplot of EMS Incidents per Census Block Group (2011-2013) by Census Block Group Population (2008-2013)

Notes: The Spearman’s rho value for the depicted relationship is .3934, p < .001; Spearman’s rho selected as the test statistic due to the distribution of the EMS Incidents per Census Block variable (see APPENDIX B for details).

Sources:
- EMS Incidents per Census Block Group (2011-2013) is derived from the Chapman Police Calls for Service Data (see CHAPTER 3, p. 62 for details) and includes any incident with an accompanying EMD code (see APPENDIX E, pp. 376-379 for details).
- Census Block Group Population obtained from the 2008-2013 American Community Survey estimates.
FIGURE 5.4 - Getis-Ord GI* Analysis of the Distribution of EMS Incidents by Census Block Group, 2011-2013

**Notes:**
- Shades of blue correspond to “cold-spots” where values are significantly lower than average
- Shades of red correspond to “hot-spots” where values are significantly higher than average
- Critical values are presented at two levels rather than three to increase map readability
- Data are plotted for $n \approx 90$ Census Block Groups.

**Source:**
- EMS Incidents per Census Block Group (2011-2013) is derived from the Chapman Police Calls for Service Data (see CHAPTER 3, p. 62 for details) and includes any incident with an accompanying EMD code (see APPENDIX E, pp. 376-379 for details).
FIGURE 5.5 - Moran’s I Scatterplot of EMS Incidents per Census Block Group (2011-2013)

Notes:
- The lagged variable refers to a spatially weighted average of the number of EMS incidents in surrounding Block Groups (see CHAPTER 5, p. 100 for details).
- The regression line displayed is the best-fit line for the global Moran’s I statistic for these data ($I = 0.2058; p < .01$ based on 9,999 Monte Carlo permutations).

Sources:
- EMS Incidents per Census Block Group (2011-2013) is derived from the Chapman Police Calls for Service Data (see CHAPTER 3, page 62 for details) and includes any incident with an accompanying EMD code (see APPENDIX E, pp. 376-379 for details).
FIGURE 5.6 - Choropleth Map of EMS Providers’ Perceptions of the Areas Where EMS Responses Frequently Occur by Census Block Group

Notes:
- Data reflect a total of \( n = 105 \) clusters from 30 out of 30 respondents (100% of sample); average number of clusters per respondent = 3.5
- Moran’s \( I \) value for this distribution = 0.4711 (\( p < .001 \))
- Categories selected using the Jenks (1967) natural breaks optimization technique.
- Data are plotted for \( n \approx 90 \) Census Block Groups.

Source:
- Number of Frequent Response Clusters is derived from the sketch mapping data (see CHAPTER 3, pp.59-61 for details).
FIGURE 5.7 - Getis-Ord GI* Analysis of EMS Providers’ Perceptions of the Areas Where EMS Responses Frequently Occur by Census Block Group

Notes:
- Data reflect a total of \( n = 105 \) clusters from 30 out of 30 respondents (100%); average number of clusters per respondent = 3.5
- Shades of blue correspond to “cold-spots” where values are significantly lower than average
- Shades of red correspond to “hot-spots” where values are significantly higher than average
- Critical values are presented at two levels rather than three to increase map readability
- Data are plotted for \( n \approx 90 \) Census Block Groups.

Source:
- Number of Frequent Response Clusters is derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details).
FIGURE 5.8 - Scatterplot of Provider Perceptions of Frequent Responses by EMS Incidents per Census Block Group (2011-2013)

Notes: The Spearman’s rho value for the depicted relationship is .5941, p < .001; Spearman’s rho selected as the test statistic due to the distribution of the EMS Incidents per Census Block variable (see APPENDIX B for details).

Sources:
- EMS Incidents per Census Block Group (2011-2013) is derived from the Chapman Police Calls for Service Data (see CHAPTER 3, p. 62 for details) and includes any incident with an accompanying EMD code (see APPENDIX E, pp. 376-379 for details).
- Number of Frequent Response Clusters is derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details). The counts refer to the number of clusters resulting from the “Frequent Calls” qualitative prompt that include a given Census Block Group.
FIGURE 5.9 - Moran’s $I$ Scatterplot of Provider Perceptions of Frequent Responses by a Spatially Lagged Measure of EMS Incidents (2011-2013) in Contiguous Census Block Groups

Notes:
- The lagged variable refers to a spatially weighted average of the number of EMS incidents in surrounding Block Groups (see CHAPTER 5, p. 103 for details).
- The regression line displayed is the best-fit line for the global Moran’s $I$ statistic for these data ($I = 0.3287$; $p < .001$ based on 9,999 Monte Carlo permutations).

Sources:
- EMS Incidents per Census Block Group (2011-2013) is derived from the Chapman Police Calls for Service Data (see CHAPTER 3, p. 62 for details) and includes any incident with an accompanying EMD code (see APPENDIX E, pp. 376-379 for details).
- Number of Frequent Response Clusters is derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details).
FIGURE 5.10 - Bivariate Choropleth Map of Disagreement Between EMS Incidents per Census Block and Provider Perceptions of Frequent Responses

Notes:
- Low = values ≤ mean;
  Medium = mean < values ≤ 1 standard deviation above the mean;
  High = 1 standard deviation above the mean > values
- Process for generating values is included in APPENDIX E (pp. 376-379 for details)

Source:
- EMS Incidents per Census Block Group (2011-2013) is derived from the Chapman Police Calls for Service Data (see CHAPTER 3, p. 62 for details) and includes any incident with an accompanying EMD code (see APPENDIX E, pp. 376-379 for details).
- Number of Frequent Response Clusters is derived from the sketch mapping data (see CHAPTER 3, p. 59-61 for details).
**FIGURE 5.11 - Spatial Distribution of Downtime Events by Address**

**Notes:**
- Categories selected using the Jenks (1967) natural breaks optimization technique.
- Data plotted for $n = 276$ events at $n = 59$ individual addresses.

**Source:** Data drawn from the EMS shift observation phase of data collection ($n = 20$ shifts; $t = 280$ hours) and includes all downtime events that (1) occurred within the City of Chapman and (2) included downtime at a specific address (downtime that consisted only of driving is not included); these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details.
TABLE 5.12 - Downtime Events by Neighborhood

<table>
<thead>
<tr>
<th>Neighborhood*</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Chapman</td>
<td>91</td>
<td>33%</td>
</tr>
<tr>
<td>West Chapman</td>
<td>3</td>
<td>1%</td>
</tr>
<tr>
<td>Uptown</td>
<td>7</td>
<td>3%</td>
</tr>
<tr>
<td>The Old Quarter</td>
<td>92</td>
<td>33%</td>
</tr>
<tr>
<td>Midtown</td>
<td>11</td>
<td>4%</td>
</tr>
<tr>
<td>Fulmore</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td>Tory Plaza</td>
<td>55</td>
<td>20%</td>
</tr>
<tr>
<td>East Chapman</td>
<td>4</td>
<td>1%</td>
</tr>
<tr>
<td>Downtown</td>
<td>11</td>
<td>4%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>276</td>
<td>100%</td>
</tr>
</tbody>
</table>

Notes:
* - Best match between address of downtime event and provider definitions of neighborhoods used here

Source: Data drawn from the EMS shift observation phase of data collection (n = 20 shifts; t = 280 hours) and includes all downtime events that (1) occurred within the City of Chapman and (2) included downtime at a specific address (downtime that consisted only of driving is not included); these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details.
# TABLE 6.1 - Anatomy of Shift “99”

<table>
<thead>
<tr>
<th>Event</th>
<th>Duration (minutes)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>Meet paramedics “Nora” and “Charlie” at Private Ambulance headquarters early in the morning; they are assigned ambulance P7</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>Drive to a drug store in Northern Chapman so that Nora can purchase some toiletries; Charlie buys a drink and a newspaper</td>
</tr>
<tr>
<td>3</td>
<td>23</td>
<td>Drive through Midtown to a small neighborhood grocery in Downtown Chapman for breakfast; wait for the bodega to open</td>
</tr>
<tr>
<td>4</td>
<td>49</td>
<td>P7 dispatched for the medical inter-facility transfer for a patient requiring cardiac care in a “cath lab”; patient treated and transported</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>Drive back through Midtown to the grocery from event 3, order breakfast sandwiches, coffee, and Power Ball lottery tickets</td>
</tr>
<tr>
<td>6</td>
<td>45</td>
<td>Drive around corner to eat; Charlie reads the newspaper he bought earlier while Nora uses her iPad; both fall asleep until next call</td>
</tr>
<tr>
<td>7</td>
<td>61</td>
<td>P7 dispatched for the mutual aid into a neighboring district for a patient with reported seizures; patient treated and transported</td>
</tr>
<tr>
<td>8</td>
<td>39</td>
<td>Drive to the Mather Hospital; Charlie uses the bathroom while Nora and I sit in the ambulance and talk</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>Dispatch requests that P7 come out to provide coverage for “downtown”; Nora uses her iPad; both fall asleep until next call</td>
</tr>
<tr>
<td>10</td>
<td>8</td>
<td>P7 dispatched for the “public assist” - sent to check on an individual who missed an appointment with their mental healthcare provider this morning; no treatment required</td>
</tr>
<tr>
<td>11</td>
<td>6</td>
<td>Nora drives us back to the convenience store and we sit until we are dispatched to the next call</td>
</tr>
<tr>
<td>12</td>
<td>100</td>
<td>P7 dispatched for the medical inter-facility transfer for a patient requiring specialty in-patient care; patient treated and transported</td>
</tr>
<tr>
<td>13</td>
<td>32</td>
<td>Return from the previous disposition to Chapman; Charlie stop for lunch at a chain Mexican fast food restaurant</td>
</tr>
<tr>
<td>14</td>
<td>17</td>
<td>Drive to a market in the Old Quarter so that Nora can get lunch as well; Charlie and I sit in the ambulance and eat our burritos but our lunch is interrupted by the next call</td>
</tr>
<tr>
<td>15</td>
<td>25</td>
<td>P7 dispatched for a patient with abdominal pain in a public housing complex; Charlie and Nora both know the patient, who they say is an “alcoholic”; patient having complications from diabetes; patient is treated and transported</td>
</tr>
<tr>
<td>16</td>
<td>76</td>
<td>We sit on the rear bumper of the ambulance in the ambulance bay at the Mather Hospital and talk; another Private Ambulance crew arrives and they tell us that a police officer was shot in a neighboring district</td>
</tr>
<tr>
<td>17</td>
<td>10</td>
<td>Dispatch again requests that P7 come out to provide coverage for “downtown”; Nora drives us to a coffee shop located at a gas station on the border between Tory Plaza and East Chapman</td>
</tr>
<tr>
<td>18</td>
<td>35</td>
<td>P7 dispatched for the traumatic injury; patient treated and transported</td>
</tr>
<tr>
<td>Event</td>
<td>Duration (minutes)</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>19</td>
<td>27</td>
<td>When Charlie alerts Dispatch that we are back in Chapman’s city limits, they request that we post to provide coverage “downtown”; we park near Downtown Plaza; Nora works on her paperwork from the previous call while Charlie makes a phone call</td>
</tr>
<tr>
<td>20</td>
<td>8</td>
<td>P7 dispatched for an unknown problem where a medical alarm has been activated; no patient found</td>
</tr>
<tr>
<td>21</td>
<td>85</td>
<td>Charlie returns us to the same downtime location he used during event 19; we sit outside the ambulance and talk about EMS work, firefighting, and the neighborhood we are parked in</td>
</tr>
<tr>
<td>22</td>
<td>50</td>
<td>Charlie drives us back towards the Old Quarter in preparation for being asked to “60” (return to headquarters) for a partner swap since Charlie is only “working a 12” today; trip takes a long time due to rush hour traffic and Dispatch requests that we “60” as we pull into the Old Quarter</td>
</tr>
<tr>
<td>23</td>
<td>7</td>
<td>Now with Nora and Tom, another paramedic, we drive back towards the Old Quarter but are interrupted by a call</td>
</tr>
<tr>
<td>24</td>
<td>31</td>
<td>P7 dispatched for the patient with a psychiatric problem; healthcare facility staff request psych evaluation; patient treated and transported</td>
</tr>
<tr>
<td>25</td>
<td>67</td>
<td>Nora decides to drive to Downtown Plaza for dinner at a middle eastern takeout restaurant that is popular with Private crews; Tom works on his run report from the previous call while we eat at an outside table near where the ambulance is parked</td>
</tr>
<tr>
<td>26</td>
<td>38</td>
<td>Nora drives north to the Old Quarter and post in Eaton Plaza; we sit quietly in the ambulance</td>
</tr>
<tr>
<td>27</td>
<td>24</td>
<td>P7 dispatched for the patient with a psychiatric problem; Nora determines that patient has been using IV drugs; patient treated and transported</td>
</tr>
<tr>
<td>28</td>
<td>13</td>
<td>Nora works on her run report from the previous call while Tom sleeps in the passenger seat</td>
</tr>
<tr>
<td>29</td>
<td>10</td>
<td>Tom decides he wants ice cream and drives us into the Uptown neighborhood; Nora and I stay in the ambulance while Tom gets ice cream</td>
</tr>
<tr>
<td>30</td>
<td>21</td>
<td>Tom returns and we drive to the Old Quarter and post in a no-parking zone next to the large city park there; Nora and Tom talk about our last patient (a “junkie”) and discuss whether he was a “drug seeker”; Tom calls his wife to say goodnight as we wait to “60” since Nora and Tom are the “base truck”</td>
</tr>
<tr>
<td>31</td>
<td>15</td>
<td>Dispatch requests that we “60” so that P7 can pick up the “vent” in preparation for a “vent transfer” (a ventilator for patients who require repertory support); Tom drives north towards headquarters and stops to gas up the ambulance</td>
</tr>
<tr>
<td>32</td>
<td>3</td>
<td>We return to headquarters and part ways for the night - I go to my car while Tom and Nora go inside to get the “vent”</td>
</tr>
</tbody>
</table>

**Notes:** Observation period is approximately 16 hours and 20 minutes long; highlighted rows are emergency calls. See CHAPTER 3, pp. 56-59 for more details on EMS shift observations.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Frequency</th>
<th>Percent*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathroom**</td>
<td>22</td>
<td>6.9%</td>
</tr>
<tr>
<td>Dining</td>
<td>73</td>
<td>22.0%</td>
</tr>
<tr>
<td>Driving</td>
<td>280</td>
<td>88.1%</td>
</tr>
<tr>
<td>Errand</td>
<td>54</td>
<td>17.0%</td>
</tr>
<tr>
<td>Paperwork</td>
<td>52</td>
<td>16.4%</td>
</tr>
<tr>
<td>Sleep</td>
<td>31</td>
<td>9.7%</td>
</tr>
<tr>
<td>Socializing</td>
<td>63</td>
<td>19.8%</td>
</tr>
</tbody>
</table>

**Notes:**
- * - Percent taken out of total number of downtime events (n=318)
- ** - Undercount in part because providers often used the restroom at hospital emergency departments after calls and these were captured as part of emergency call notes rather than downtime events

**Source:** Data drawn from the EMS shift observation phase of data collection (n = 20 shifts; t = 280 hours) and includes all downtime events that occurred within the City of Chapman. See CHAPTER 3, pp. 56-59 for more details.
FIGURE 6.3 - An Expanded Sociology of Work Time

Source: Based on Perlow’s (1999) original model of the sociology of work time, which is reproduced in FIGURE 2.2 (see p. 255).
FIGURE 6.4 - Time-Geography of Shift 99

Notes:
- Event 23 is the site where a downtime drive was interrupted by dispatch to a call
- Graphic inspired by Minard’s 1869 map of Napoleon’s Russian campaign, which illustrates how count data (the size of Napoleon’s army) changed over time and space (see Tufte 1990).
- Scene locations are masked using Census Block Groups to protect patient confidentiality (see CHAPTER 3, pp. 70-72).

Source: Data based on the turn-by-turn travel route data collected during the EMS shift observation phase of data collection (see CHAPTER 3, pp. 56-59) as well as additional geocoded data collected during those shifts.
FIGURE 6.5 - Map of Dining Events During Downtime

Source: Data drawn from the EMS shift observation phase of data collection (n = 20 shifts; t = 280 hours) and includes all downtime events that (1) occurred within the City of Chapman and (2) included dining downtime activities at a specific address (downtime that consisted only of driving is not included); these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details.
### TABLE 6.6 - Spatial Concentration of Downtime Activities by Address

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of Addresses</th>
<th>Percent of Valid Addresses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathroom</td>
<td>7</td>
<td>11.86%</td>
</tr>
<tr>
<td>Dining, Purchases*</td>
<td>32</td>
<td>54.24%</td>
</tr>
<tr>
<td>Dining, Purchases &amp; Eating**</td>
<td>36</td>
<td>61.02%</td>
</tr>
<tr>
<td>Errand</td>
<td>20</td>
<td>33.90%</td>
</tr>
<tr>
<td>Paperwork</td>
<td>16</td>
<td>27.12%</td>
</tr>
<tr>
<td>Sleep</td>
<td>8</td>
<td>13.56%</td>
</tr>
<tr>
<td>Socializing</td>
<td>14</td>
<td>23.73%</td>
</tr>
</tbody>
</table>

**Notes:**
- * - includes any visits to restaurants or stores to purchase food
- ** - includes any visits to restaurants or stores to purchase food as well as any consumption of food

**Source:** Data drawn from the EMS shift observation phase of data collection (n = 20 shifts; t = 280 hours) and includes all downtime events that (1) occurred within the City of Chapman and (2) included downtime at a specific address (downtime that consisted only of driving is not included); these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details. See CHAPTER 3, pp. 56-59 for more details.
FIGURE 6.7 - Map of Errands During Downtime

Source: Data drawn from the EMS shift observation phase of data collection (n = 20 shifts; t = 280 hours) and includes all downtime events that (1) occurred within the City of Chapman and (2) included errand downtime activities at a specific address (downtime that consisted only of driving is not included); these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details. See CHAPTER 3, pp. 56-59 for more details.
FIGURE 6.8 - Map of Bathroom Use During Downtime

Source: Data drawn from the EMS shift observation phase of data collection \((n = 20\text{ shifts}; t = 280\text{ hours})\) and includes all downtime events that (1) occurred within the City of Chapman and (2) included bathroom use during downtime at a specific address (downtime that consisted only of driving is not included); these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details. See CHAPTER 3, pp. 56-59 for more details.
FIGURE 6.9 - Map of Sleeping During Downtime

Source: Data drawn from the EMS shift observation phase of data collection (n = 20 shifts; t = 280 hours) and includes all downtime events that (1) occurred within the City of Chapman and (2) included sleeping during downtime at a specific address (downtime that consisted only of driving is not included); these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details.
### TABLE 6.10 - Downtime Events by Neighborhood and Focal Point

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Frequency</th>
<th>Percent</th>
<th>Within Neighborhood Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North Chapman</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Ambulance</td>
<td>66</td>
<td>24%</td>
<td>73%</td>
</tr>
<tr>
<td>All other addresses</td>
<td>25</td>
<td>9%</td>
<td>27%</td>
</tr>
<tr>
<td><strong>Neighborhood subtotal</strong></td>
<td>91</td>
<td>33%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>The Old Quarter</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eaton Plaza (all)*</td>
<td>39</td>
<td>17%</td>
<td>51%</td>
</tr>
<tr>
<td>City Park</td>
<td>12</td>
<td>4%</td>
<td>13%</td>
</tr>
<tr>
<td>All other addresses</td>
<td>41</td>
<td>12%</td>
<td>36%</td>
</tr>
<tr>
<td><strong>Neighborhood subtotal</strong></td>
<td>92</td>
<td>33%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Tory Plaza</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mather Hospital</td>
<td>46</td>
<td>17%</td>
<td>84%</td>
</tr>
<tr>
<td>All other addresses</td>
<td>9</td>
<td>3%</td>
<td>16%</td>
</tr>
<tr>
<td><strong>Neighborhood subtotal</strong></td>
<td>55</td>
<td>20%</td>
<td>100%</td>
</tr>
<tr>
<td>All other neighborhoods</td>
<td>38</td>
<td>14%</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>276</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** * - includes both the Eaton Plaza loading zone and three adjacent addresses that are all within one block of the loading zone

**Source:** Data drawn from the EMS shift observation phase of data collection \((n = 20 \text{ shifts}; t = 280 \text{ hours})\) and includes all downtime events that (1) occurred within the City of Chapman and (2) included downtime at a specific address (downtime that consisted only of driving is not included); these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details.
### TABLE 6.11 - Focal Points’ Share of Downtime Activities (Percent)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Private Ambulance</th>
<th>Eaton Plaza (all)</th>
<th>City Park</th>
<th>Mather Hospital</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathroom</td>
<td>13.04%</td>
<td>17.39%</td>
<td>0.00%</td>
<td>52.17%</td>
<td>82.60%</td>
</tr>
<tr>
<td>Dining, Purchases*</td>
<td>0.00%</td>
<td>25.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>25.00%</td>
</tr>
<tr>
<td>Dining, Purchases &amp; Eating**</td>
<td>5.71%</td>
<td>25.71%</td>
<td>0.00%</td>
<td>8.57%</td>
<td>39.99%</td>
</tr>
<tr>
<td>Errands</td>
<td>0.00%</td>
<td>3.92%</td>
<td>0.00%</td>
<td>5.88%</td>
<td>9.80%</td>
</tr>
<tr>
<td>Paperwork</td>
<td>4.65%</td>
<td>25.58%</td>
<td>2.32%</td>
<td>34.88%</td>
<td>67.43%</td>
</tr>
<tr>
<td>Sleep</td>
<td>16.13%</td>
<td>22.58%</td>
<td>16.13%</td>
<td>32.26%</td>
<td>87.10%</td>
</tr>
<tr>
<td>Socializing</td>
<td>40.98%</td>
<td>11.48%</td>
<td>3.28%</td>
<td>26.23%</td>
<td>81.97%</td>
</tr>
</tbody>
</table>

**Notes:**
- * - includes any visits to restaurants or stores to purchase food
- ** - includes any visits to restaurants or stores to purchase food as well as any consumption of food

**Source:** Data drawn from the EMS shift observation phase of data collection (n = 20 shifts; t = 280 hours) and includes all downtime events that (1) occurred within the City of Chapman and (2) included downtime at a specific focal point address (downtime that consisted only of driving is not included); these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details.
FIGURE 6.12 - Map of Socializing During Downtime

Source: Data drawn from the EMS shift observation phase of data collection ($n = 20$ shifts; $t = 280$ hours) and includes all downtime events that (1) occurred within the City of Chapman and (2) included socializing during downtime at a specific address (downtime that consisted only of driving is not included); these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details.
FIGURE 6.13 - Map of Eaton Plaza

Notes:
- Pre refers to count of downtime events before the Eaton Plaza ban
- Post refers to count of downtime events after the Eaton Plaza ban

Source: Data drawn from the EMS shift observation phase of data collection ($n = 20$ shifts; $t = 280$ hours) and includes all downtime events that (1) occurred within the City of Chapman and (2) included downtime at one of four addresses in Eaton Plaza (downtime that consisted only of driving is not included); these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details.
<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Pre-Eaton Plaza Ban</th>
<th>Post-Eaton Plaza Ban</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>North Chapman</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Ambulance</td>
<td>47</td>
<td>25.5%</td>
</tr>
<tr>
<td>All other addresses</td>
<td>13</td>
<td>7.1%</td>
</tr>
<tr>
<td><strong>Neighborhood subtotal</strong></td>
<td>60</td>
<td>32.6%</td>
</tr>
<tr>
<td>The Old Quarter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eaton Plaza (proper)</td>
<td>38</td>
<td>20.7%</td>
</tr>
<tr>
<td>Eaton Plaza (adjacent) †</td>
<td>3</td>
<td>1.6%</td>
</tr>
<tr>
<td>City Park</td>
<td>5</td>
<td>2.7%</td>
</tr>
<tr>
<td>All other addresses</td>
<td>21</td>
<td>11.4%</td>
</tr>
<tr>
<td><strong>Neighborhood subtotal</strong></td>
<td>67</td>
<td>36.4%</td>
</tr>
<tr>
<td>Tory Plaza</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mather Hospital</td>
<td>26</td>
<td>14.1%</td>
</tr>
<tr>
<td>All other addresses</td>
<td>5</td>
<td>2.7%</td>
</tr>
<tr>
<td><strong>Neighborhood subtotal</strong></td>
<td>31</td>
<td>16.8%</td>
</tr>
<tr>
<td>All other neighborhoods</td>
<td>26</td>
<td>14.2%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>184</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Notes:* † - includes three addresses that are within one block of the main Eaton Plaza loading zone

*Source:* Data drawn from the EMS shift observation phase of data collection (n = 20 shifts; t = 280 hours) and includes all downtime events that (1) occurred within the City of Chapman and (2) included downtime at a specific focal point address (downtime that consisted only of driving is not included); these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details.
TABLE 7.1 - Summary of Non- and Sub-Acute Call Types Identified during Field Work

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeless</td>
<td>Calls for patients who were known or believed to be homeless, which could cover a wide range of clinical issues including substance use, chronic illnesses, and complications from exposure to the elements.</td>
</tr>
<tr>
<td>Substance Use</td>
<td>Calls primarily for acute alcohol intoxication among (1) patients who were homeless, (2) college students, or (3) other individuals. After alcohol intoxication, opioid use was the next most frequently observed type of substance use.</td>
</tr>
<tr>
<td>Psychiatric</td>
<td>Calls for (1) suicide attempts or suicidal ideations, (2) symptoms of a mental illness such as depression, hallucinations, or manic behavior, or (3) psychiatric transfers from an Emergency Department to a long-term psychiatric facility.</td>
</tr>
<tr>
<td>Non-Acute</td>
<td>Calls for a wide range of issues including falls without injury, calls where there was no medical compliant, or calls where providers believed the medical complaints were minor in nature.</td>
</tr>
<tr>
<td>Chronic</td>
<td>Calls for complications from issues including chronic cardiac diseases, cancer, and diabetes.</td>
</tr>
</tbody>
</table>

Notes: Definitions derived from review of the EMS shift observation field notes (see CHAPTER 3, pp. 59-61 and pp. 65-66).
TABLE 7.2 - CHAPTERS’ 7 and 8 Variables and Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bivariate Map Overestimate</td>
<td>0.14</td>
<td>0.35</td>
<td>0.00-1.00</td>
</tr>
<tr>
<td>Midtown</td>
<td>0.14</td>
<td>0.35</td>
<td>0.00-1.00</td>
</tr>
<tr>
<td>Provider Perceptions Scale</td>
<td>5.75</td>
<td>7.11</td>
<td>0.00-24.67</td>
</tr>
<tr>
<td>Homeless Call Sketch Map Clusters* †</td>
<td>5.61</td>
<td>9.12</td>
<td>0.00-30.00</td>
</tr>
<tr>
<td>Substance Use Call Sketch Map Clusters* †</td>
<td>7.59</td>
<td>8.86</td>
<td>0.00-31.00</td>
</tr>
<tr>
<td>“Psych Call” Sketch Map Clusters†</td>
<td>4.03</td>
<td>3.83</td>
<td>0.00-13.00</td>
</tr>
<tr>
<td>Chronic Illness Sketch Map Clusters†</td>
<td>3.52</td>
<td>1.93</td>
<td>0.00-9.00</td>
</tr>
<tr>
<td>Non-Acute Sketch Map Clusters †</td>
<td>3.40</td>
<td>3.44</td>
<td>0.00-13.00</td>
</tr>
<tr>
<td>Call Types Scale</td>
<td>35.47</td>
<td>51.74</td>
<td>2.00-289.33</td>
</tr>
<tr>
<td>137D Police Incidents**</td>
<td>41.56</td>
<td>94.73</td>
<td>0.00-605.00</td>
</tr>
<tr>
<td>Man Down EMS Incidents**</td>
<td>56.40</td>
<td>84.97</td>
<td>0.00-527.00</td>
</tr>
<tr>
<td>Unwanted Person Police Incidents**</td>
<td>64.13</td>
<td>102.31</td>
<td>1.00-594.00</td>
</tr>
<tr>
<td>Unconscious EMS Incidents**</td>
<td>29.73</td>
<td>29.72</td>
<td>2.00-143.00</td>
</tr>
<tr>
<td>Overdose EMS Incidents**</td>
<td>5.31</td>
<td>10.33</td>
<td>0.00-91.00</td>
</tr>
<tr>
<td>Psych/Suicide EMS Incidents**</td>
<td>15.68</td>
<td>16.40</td>
<td>0.00-71.00</td>
</tr>
<tr>
<td>Count, Non-White Individuals</td>
<td>391.32</td>
<td>350.74</td>
<td>15.00-2432.00</td>
</tr>
<tr>
<td>Count, Hispanic Individuals</td>
<td>95.16</td>
<td>78.70</td>
<td>0.00-328.00</td>
</tr>
<tr>
<td>Count, Individuals Below Poverty Line</td>
<td>70.74</td>
<td>66.51</td>
<td>0.00-303.00</td>
</tr>
<tr>
<td>Per-Capita Income</td>
<td>51430.20</td>
<td>32163.87</td>
<td>4409-212722</td>
</tr>
</tbody>
</table>

Notes:
- variables included if they appear in regression models
- * - variables included in the “provider perceptions” scale
- ** - variables included in the “call types” scale
- † - Appendix B contains additional descriptive statistics for these variables
# TABLE 7.3 - EMS Shift Observation Interventions by Category

<table>
<thead>
<tr>
<th>Acuity</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>87</td>
<td>69.05%</td>
<td>69.05%</td>
</tr>
<tr>
<td>Yellow</td>
<td>33</td>
<td>26.19%</td>
<td>95.24%</td>
</tr>
<tr>
<td>Red</td>
<td>6</td>
<td>4.76%</td>
<td>100%</td>
</tr>
<tr>
<td>Black</td>
<td>0</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>126</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Green = calls where only Basic Life Support interventions were used
- Yellow = calls with some Advanced Life Support interventions, such as routine cardiac monitoring, were used
- Red = calls with Advanced Life Support interventions where providers characterized the patient as seriously ill or injured
- Black = calls of patients who were deceased or in cardiac arrest

**Source:** Data drawn from the EMS shift observation phase of data collection (n = 20 shifts; t = 280 hours) and includes all emergency call events that (1) occurred within the City of Chapman and (2) included patient contact; these events are labeled as “valid” in TABLE 5.1. See CHAPTER 3, pp. 56-59 for more details.
# TABLE 7.4 - Calls for Service Acuity, 2011-2013

<table>
<thead>
<tr>
<th>Acuity†</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
<th>Moran’s I‡</th>
<th>Empirical Bayes Moran’s I^</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omega</td>
<td>236</td>
<td>0.76%</td>
<td>0.76%</td>
<td>0.0533</td>
<td>0.0646</td>
</tr>
<tr>
<td>Alpha</td>
<td>9,863</td>
<td>31.88%</td>
<td>32.74%</td>
<td>0.1020**</td>
<td>0.0341*</td>
</tr>
<tr>
<td>Bravo</td>
<td>8,830</td>
<td>28.54%</td>
<td>61.18%</td>
<td>0.1544***</td>
<td>0.0323*</td>
</tr>
<tr>
<td>Charlie</td>
<td>5,418</td>
<td>17.51%</td>
<td>78.69%</td>
<td>0.0642*</td>
<td>0.0115</td>
</tr>
<tr>
<td>Delta</td>
<td>6,277</td>
<td>20.29%</td>
<td>98.98%</td>
<td>0.1410***</td>
<td>0.0324*</td>
</tr>
<tr>
<td>Echo</td>
<td>315</td>
<td>1.02%</td>
<td>100%</td>
<td>-0.0116</td>
<td>0.0125</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>30,939</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Critical values = * - p < .05; ** - p < .01; *** - p < .001
- † - Omega level calls are coded as the least acute at dispatch, acuity increases with each level and Echo level calls are coded as the most acute; see this chapter’s “Data and Analyses Section” for details on these categories as well as APPENDIX E, pp. 376-379 for details on the types of incidents that constitute these acuity levels
- ‡ - Moran’s I is a measure of global spatial autocorrelation; see CHAPTER 3, pp. 68-70 for a detailed description of this statistic
- ^ - All Moran’s I values were checked using population rates to ensure that observed clustering was not due to population density using the Empirical Bayes Moran’s I, which is a statistically robust measure of global spatial autocorrelation for rate data; p-values were generated using a Monte Carlo simulation with 9,999 permutations; see CHAPTER 3, pp. 68-70 for a detailed description of this statistic as well as the ways in which the conceptualization of spatial relationships differs for these tests. See also APPENDIX E, pp. 376-379 for details on the conceptualization of spatial relationships.

**Sources:**
- EMS Incidents (2011-2013) is derived from the Chapman Police Calls for Service Data (see CHAPTER 3, page 62 for details) and includes any incident with an accompanying EMD code (see APPENDIX E, pp. 376-379 for details).
TABLE 7.5 - The Distribution of Acuity Determined at Dispatch for “Psych Calls”, 2011-2013

<table>
<thead>
<tr>
<th>Description</th>
<th>MDPS Code</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-suicidal and alert</td>
<td>25-A-1</td>
<td>663</td>
<td>45.15%</td>
</tr>
<tr>
<td>Suicidal (not threatening) and alert</td>
<td>25-A-2</td>
<td>138</td>
<td>9.84%</td>
</tr>
<tr>
<td><strong>Subtotal, Alpha Level Calls</strong></td>
<td></td>
<td>801</td>
<td>54.99%</td>
</tr>
<tr>
<td>Serious hemorrhage</td>
<td>25-B-1</td>
<td>7</td>
<td>0.50%</td>
</tr>
<tr>
<td>Non-serious or minor hemorrhage</td>
<td>25-B-2</td>
<td>10</td>
<td>0.71%</td>
</tr>
<tr>
<td>Threatening suicide</td>
<td>25-B-3</td>
<td>392</td>
<td>27.96%</td>
</tr>
<tr>
<td>Jumper (threatening)</td>
<td>25-B-4</td>
<td>5</td>
<td>0.36%</td>
</tr>
<tr>
<td>Near hanging, strangulation or suffocation (alert)</td>
<td>25-B-5</td>
<td>2</td>
<td>0.14%</td>
</tr>
<tr>
<td>Unknown status/other codes not applicable</td>
<td>25-B-6</td>
<td>145</td>
<td>10.34%</td>
</tr>
<tr>
<td><strong>Subtotal, Bravo Level Calls</strong></td>
<td></td>
<td>561</td>
<td>40.01%</td>
</tr>
<tr>
<td><strong>Subtotal, All BLS Level Calls (Alpha + Bravo)</strong></td>
<td></td>
<td>1362</td>
<td>95.00%</td>
</tr>
<tr>
<td>Not alert</td>
<td>25-D-1</td>
<td>61</td>
<td>4.35%</td>
</tr>
<tr>
<td>Dangerous hemorrhage</td>
<td>25-D-2</td>
<td>9</td>
<td>0.64%</td>
</tr>
<tr>
<td><strong>Subtotal, Delta Level Calls</strong></td>
<td></td>
<td>70</td>
<td>4.99%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>1432</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Sources:* EMS Incidents (2011-2013) are derived from the Chapman Police Calls for Service Data (see CHAPTER 3, page 62 for details) and includes any incident with an accompanying EMD code (see APPENDIX E, pp. 376-379 for details).
FIGURE 7.6 - Linked Small Multiples of EMS Provider Perceptions of the Spatial Distribution of Their Work

Notes:
- Linked multiple design based on Tufte (1990)
- Since these maps understate variation in the spatial distributions for Psychiatric Calls (B.5), Non-Acute Calls (B.6), and Chronic Illnesses (B.7), full-sized choropleth maps for these three variables are included with their descriptive statistics in Appendix B.

Source: Distributions are derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details).
FIGURE 7.7 - Linked Small Multiples of the Getis-Ord GI* Analyses of EMS Provider Perceptions of the Spatial Distribution of Their Work

Notes: Linked multiple design based on Tufte (1990)

Source: Distributions are derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details).
### TABLE 7.8 - Summary of Descriptive Statistics of EMS Provider Perceptions of the Spatial Distribution of Their Work

<table>
<thead>
<tr>
<th>Type</th>
<th>n of Clusters</th>
<th>Percent of Respondents</th>
<th>Average Number of Clusters per Respondent</th>
<th>Moran’s $I^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent Calls</td>
<td>105</td>
<td>100.00%</td>
<td>3.50</td>
<td>0.4711</td>
</tr>
<tr>
<td>Homeless Patients</td>
<td>80</td>
<td>100.00%</td>
<td>2.67</td>
<td>0.4042</td>
</tr>
<tr>
<td>Substance Use</td>
<td>93</td>
<td>100.00%</td>
<td>3.10</td>
<td>0.5027</td>
</tr>
<tr>
<td>Psychiatric Calls</td>
<td>35</td>
<td>56.67%</td>
<td>2.06</td>
<td>0.6047</td>
</tr>
<tr>
<td>Non-Acute Calls</td>
<td>36</td>
<td>43.33%</td>
<td>2.77</td>
<td>0.5100</td>
</tr>
<tr>
<td>Chronic Illness Calls</td>
<td>36</td>
<td>50.00%</td>
<td>2.00</td>
<td>0.3579</td>
</tr>
</tbody>
</table>

*Notes: * - $p < .001$ for all given Moran’s $I$ values; Moran’s I is a measure of global spatial autocorrelation; see CHAPTER 3, pp. 68-70 for a detailed description of this statistic.

*Source: Distributions are derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details).*
TABLE 7.9 - Spearman’s *rho* Correlation Analysis of EMS Provider Perceptions of the Spatial Distribution of Their Work

<table>
<thead>
<tr>
<th></th>
<th>Frequent</th>
<th>Homeless</th>
<th>Substance Use</th>
<th>Psychiatric</th>
<th>Non-Acute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeless</td>
<td>0.8805</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substance Use</td>
<td>0.8750</td>
<td>0.8491</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychiatric</td>
<td>0.8630</td>
<td>0.8305</td>
<td>0.8399</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>Non-Acute</td>
<td>0.5879</td>
<td>0.5439</td>
<td>0.4973</td>
<td>0.5588</td>
<td>1.0000</td>
</tr>
<tr>
<td>Chronic</td>
<td>0.6221</td>
<td>0.5315</td>
<td>0.6315</td>
<td>0.6597</td>
<td>0.4715</td>
</tr>
</tbody>
</table>

*Notes:*
- *p < .001* for all given Spearman’s *rho* values
- first row (Frequent, Frequent) omitted to increase readability of table
- final column (Chronic, Chronic) omitted to increase readability of table

*Source:*Distributions are derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details).
### TABLE 7.10 - Final Cronbach’s *Alpha* Analysis of EMS Provider Perceptions of the Spatial Distribution of Their Work

<table>
<thead>
<tr>
<th>Item</th>
<th>Sign</th>
<th>Item-Test Correlation</th>
<th>Item-Rest Correlation</th>
<th>Average Interitem Covariance</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeless</td>
<td>+</td>
<td>0.9831</td>
<td>0.9498</td>
<td>31.31296</td>
<td>0.8040</td>
</tr>
<tr>
<td>Substance Use</td>
<td>+</td>
<td>0.9857</td>
<td>0.9591</td>
<td>31.57654</td>
<td>0.7851</td>
</tr>
<tr>
<td>Psychiatric</td>
<td>+</td>
<td>0.9501</td>
<td>0.9270</td>
<td>76.4838</td>
<td>0.9725</td>
</tr>
<tr>
<td><strong>Scale</strong></td>
<td></td>
<td></td>
<td></td>
<td>46.45777</td>
<td>0.9190</td>
</tr>
<tr>
<td>Minimum:</td>
<td></td>
<td>0.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum:</td>
<td></td>
<td>24.6667</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean:</td>
<td></td>
<td>5.7462</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard Deviation:</td>
<td></td>
<td>7.1102</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- See CHAPTER 7, pp. 166-167 for details on the creation of this scale.
- Distributions for Calls for Chronic Illness and Non-Acute Calls were omitted due to only moderate correlations with the other items.

**Source:** Distributions are derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details).
FIGURE 7.11 - Choropleth Map of the Provider Perceptions Scale

Notes:
- Data reflect the average number of clusters per Census Block Group from the three distributions included in the scale
- Moran’s I value for this distribution = 0.4711 ($p < .001$)
- Categories selected using the Jenks (1967) natural breaks optimization technique.
- Data are plotted for $n \approx 90$ Census Block Groups.

Source: The provider perceptions scale consists of three components: the number of clusters per Census Block Group for (1) calls for the homeless, (2) calls for substance use, and (3) “psych calls”. See CHAPTER 7 (pp. 166-167) for additional details.
FIGURE 7.12 - Getis-Ord GI* Analysis of the Provider Perceptions Scale

Notes:
- Data reflect the average number of clusters per Census Block Group from the three distributions included in the scale.
- Shades of blue correspond to “cold-spots” where values are significantly lower than average.
- Shades of red correspond to “hot-spots” where values are significantly higher than average.
- Critical values are presented at two levels rather than three to increase map readability.
- Data are plotted for $n \approx 90$ Census Block Groups.

Source: The provider perceptions scale consists of three components: the number of clusters per Census Block Group for (1) calls for the homeless, (2) calls for substance use, and (3) “psych calls”. See CHAPTER 7 (pp. 166-167) for additional details.
TABLE 7.13 - Spearman’s rho Correlation Analysis of EMS Provider Perceptions of the Spatial Distribution of Their Work and Call Types per Census Block Group

<table>
<thead>
<tr>
<th></th>
<th>Homeless</th>
<th>Substance Use</th>
<th>Psychiatric</th>
<th>Non-Acute</th>
<th>Chronic</th>
</tr>
</thead>
<tbody>
<tr>
<td>137D†</td>
<td>0.7022***</td>
<td>0.8212***</td>
<td>0.6928***</td>
<td>0.3512***</td>
<td>0.5713***</td>
</tr>
<tr>
<td>Man Down‡</td>
<td>0.7123***</td>
<td>0.7748***</td>
<td>0.6444***</td>
<td>0.2881**</td>
<td>0.5390***</td>
</tr>
<tr>
<td>Unwanted Person‡</td>
<td>0.6321***</td>
<td>0.7470***</td>
<td>0.5604***</td>
<td>0.2909**</td>
<td>0.4524***</td>
</tr>
<tr>
<td>Unconscious‡</td>
<td>0.6289***</td>
<td>0.6350***</td>
<td>0.5735***</td>
<td>0.3397**</td>
<td>0.3633***</td>
</tr>
<tr>
<td>Overdose‡</td>
<td>0.4268***</td>
<td>0.4675***</td>
<td>0.3518***</td>
<td>0.2022</td>
<td>0.2645*</td>
</tr>
<tr>
<td>Psych/Suicide‡</td>
<td>0.4456***</td>
<td>0.5384***</td>
<td>0.4294***</td>
<td>0.1815</td>
<td>0.3798***</td>
</tr>
<tr>
<td>EMD ‘Alpha’^</td>
<td>0.4765***</td>
<td>0.5651***</td>
<td>0.4417***</td>
<td>0.2154*</td>
<td>0.4014***</td>
</tr>
<tr>
<td>EMD ‘Bravo’^</td>
<td>0.6230***</td>
<td>0.6837***</td>
<td>0.5730***</td>
<td>0.2612*</td>
<td>0.4833***</td>
</tr>
<tr>
<td>EMD, All BLS%</td>
<td>0.5503***</td>
<td>0.6321***</td>
<td>0.5118***</td>
<td>0.2305*</td>
<td>0.4451***</td>
</tr>
</tbody>
</table>

Notes:
- Critical values = * - p < .05; ** - p < .01; *** - p < .001
- Highlighted cells indicate relationships where provider conceptualizations of their work align most closely with the definitions of the given incident types
- † - Police incidents types that providers describe responding to on a regular basis
- ‡ - Emergency Medical Dispatch incident types:
  - Man Down = Unknown Problem (Man Down); MPDS Protocol 32
  - Unconscious = Unconscious/Fainting (Near); MPDS Protocol 31
  - Overdose = Overdose/Poisoning (Ingestion); MPDS Protocol 23
  - Psych/Suicide = Psychiatric/Abnormal Behavior/Suicide Attempt; MPDS Protocol 25
- ^ - Summaries of Emergency Medical Dispatch incident types with the given determinant level
- ‰ - Includes the sum of all ‘Omega’, ‘Alpha’, and ‘Bravo’ determinant level incidents for each Census Block Group; see this chapter’s “Data and Analyses Section” for details on these categories as well as APPENDIX E, pp. 376-379 for details on the types of incidents that constitute these acuity levels

Sources:
- EMS Incidents and Police Incidents(2011-2013) are derived from the Chapman Police Calls for Service Data (see CHAPTER 3, page 62 for details); EMS Incidents includes any incident with an accompanying EMD code (see APPENDIX E, pp. 376-379 for details).
- EMS Provider Perceptions are derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details).
<table>
<thead>
<tr>
<th></th>
<th>Homeless</th>
<th>Substance Use</th>
<th>Psychiatric</th>
<th>Non-Acute</th>
<th>Chronic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count, Non-White</td>
<td>0.3383**</td>
<td>0.3199**</td>
<td>0.3060**</td>
<td>0.0580</td>
<td>0.2236</td>
</tr>
<tr>
<td>Count, Hispanic</td>
<td>0.2841**</td>
<td>0.2603*</td>
<td>0.2986**</td>
<td>0.0258</td>
<td>0.1413</td>
</tr>
<tr>
<td>Poverty</td>
<td>0.1794</td>
<td>0.2153*</td>
<td>0.1870</td>
<td>-0.0774</td>
<td>0.2682*</td>
</tr>
<tr>
<td>Per-Capita Income</td>
<td>-0.3583***</td>
<td>-0.3721***</td>
<td>-0.3599***</td>
<td>-0.0328</td>
<td>-0.2669*</td>
</tr>
</tbody>
</table>

**Notes:** Critical values = * - p < .05; ** - p < .01; *** - p < .001

**Sources:**
- Demographic data drawn from the 2008-2013 American Community Survey
- EMS Provider Perceptions are derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details).
TABLE 7.15 - Final Cronbach's *Alpha* Analysis of Call Types

<table>
<thead>
<tr>
<th>Item</th>
<th>Sign</th>
<th>Item-Test Correlation</th>
<th>Item-Rest Correlation</th>
<th>Average Interitem Covariance</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-37D†</td>
<td>+</td>
<td>0.9359</td>
<td>0.8730</td>
<td>1568.370</td>
<td>0.7793</td>
</tr>
<tr>
<td>Man Down‡</td>
<td>+</td>
<td>0.9703</td>
<td>0.9448</td>
<td>1585.645</td>
<td>0.7563</td>
</tr>
<tr>
<td>Unwanted Person†</td>
<td>+</td>
<td>0.9471</td>
<td>0.8873</td>
<td>1461.776</td>
<td>0.7828</td>
</tr>
<tr>
<td>Unconscious‡</td>
<td>+</td>
<td>0.8511</td>
<td>0.8211</td>
<td>2726.462</td>
<td>0.8357</td>
</tr>
<tr>
<td>Overdose‡</td>
<td>+</td>
<td>0.4916</td>
<td>0.4657</td>
<td>3276.426</td>
<td>0.8775</td>
</tr>
<tr>
<td>Psych/Suicide‡</td>
<td>+</td>
<td>0.7374</td>
<td>0.7118</td>
<td>3074.831</td>
<td>0.8623</td>
</tr>
</tbody>
</table>

**Scale**

| Minimum:               | 2.0000 |
| Maximum:               | 289.3333 |
| Mean:                  | 35.4659 |
| Standard Deviation:    | 51.7436 |

**Notes:**
- See CHAPTER 7, pp. 167-169 for details on the creation of this scale.

- † - Police incidents types that providers describe responding to on a regular basis
- ‡ - Emergency Medical Dispatch incident types:
  - Man Down = Unknown Problem (Man Down); MPDS Protocol 32
  - Unconscious = Unconscious/Fainting (Near); MPDS Protocol 31
  - Overdose = Overdose/Poisoning (Ingestion); MPDS Protocol 23
  - Psych/Suicide = Psychiatric/Abnormal Behavior/Suicide Attempt; MPDS Protocol 25

**Sources:** EMS Incidents and Police Incidents(2011-2013) are derived from the Chapman Police Calls for Service Data (see CHAPTER 3, page 62 for details); EMS Incidents includes any incident with an accompanying EMD code (see APPENDIX E, pp. 376-379 for details).
TABLE 7.16 - Logistic Regression Analyses of Provider Perceptions on Their Overestimations of Call Volume

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds Ratio</td>
<td>Standard Error</td>
<td>95% CI</td>
</tr>
<tr>
<td>Perceptions Scale</td>
<td>1.23***</td>
<td>0.06</td>
<td>1.12-1.35</td>
</tr>
<tr>
<td>Call Types Scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count, Non-White</td>
<td>1.00</td>
<td>0.01</td>
<td>0.99-1.01</td>
</tr>
<tr>
<td>Count, Hispanic</td>
<td>1.00</td>
<td>0.01</td>
<td>0.99-1.02</td>
</tr>
<tr>
<td>Per-Capita Income</td>
<td>1.00</td>
<td>0.01</td>
<td>0.99-1.00</td>
</tr>
<tr>
<td>Constant</td>
<td>0.02***</td>
<td>0.02</td>
<td>0.01-0.09</td>
</tr>
<tr>
<td>Log Likelihood</td>
<td>-22.537</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LR Chi²</td>
<td>25.03</td>
<td>(df=1)</td>
<td></td>
</tr>
<tr>
<td>p &gt; LR Chi²</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>McFadden’s Adjusted R²</td>
<td>0.300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tjur’s D</td>
<td>0.316</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIC</td>
<td>49.075</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIC</td>
<td>54.029</td>
<td>(df=2)</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
- Critical values = * - p < .05; ** - p < .01; *** - p < .001
- Observations ≈ 90
- Models 2 and 3 pass additional specification tests, including Hosmer-Lemeshow Chi² and the link test
FIGURE 8.1 - Sketch Map Clusters with “Midtown” Subjective Location

Source: EMS Provider Perceptions are derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details).
FIGURE 8.2 - Midtown Geography and Land Use Summary

Source: Data on Midtown are derived from the neighborhood observations data (see CHAPTER 3, p. 56 for details).
FIGURE 8.3 - Sketch Map Frequencies with Midtown Emphasized

Notes:
- Linked multiple design based on Tufte (1990)
- Since these maps understate variation in the spatial distributions for Psychiatric Calls (B.5), Non-Acute Calls (B.6), and Chronic Illnesses (B.7), full-sized choropleth maps for these three variables are included with their descriptive statistics in Appendix B.

Source: Distributions are derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details).
FIGURE 8.4 - Sketch Map Getis-Ord GI* Data with Midtown Emphasized

Notes: Linked multiple design based on Tufte (1990)

Source: Distributions are derived from the sketch mapping data (see CHAPTER 3, pp. 59-61 for details).
TABLE 8.5 - OLS Regression Analyses of Provider Perceptions of “Grunt Work”

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>Robust Standard Error</td>
<td>95% CI</td>
</tr>
<tr>
<td>Call Types Scale</td>
<td>0.056***</td>
<td>0.01</td>
<td>0.03-0.08</td>
</tr>
<tr>
<td>Count, Non-White</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count, Hispanic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty</td>
<td>-0.015*</td>
<td>0.007</td>
<td></td>
</tr>
<tr>
<td>Per-Capita Income</td>
<td>-3.20E-06</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>3.447***</td>
<td>0.48</td>
<td>2.50-4.39</td>
</tr>
<tr>
<td>F</td>
<td>193.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p &gt; F</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.666</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIC</td>
<td>500.483</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIC</td>
<td>505.438 (df=2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
- Critical values = * - p < .05; ** - p < .01; *** - p < .001
- Observations ≈ 90
FIGURE 8.6 - Inter-neighborhood Connections in Chapman’s Homeless Services

Notes: These various locations are described in detail in CHAPTER 8, pp. 178-181.

Source: Data on Midtown are derived from the neighborhood observations data (see CHAPTER 3, p. 56 for details).
<table>
<thead>
<tr>
<th>Question 1</th>
<th>Explain the ways in which neighborhood conditions and context influence the daily work routines of providers.</th>
</tr>
</thead>
</table>
| Relevant Findings | • Daily work routines are described as “downtime activities”, which can cover a wide range of events including running errands for dispatchers, doing paperwork, staying fed and rested, finding sources of entertainment to pass the time, and socializing with other providers.  
• Downtime activities are focused primarily on a subset of neighborhoods in the center of the city.  
• These neighborhoods contain “focal points” that allow providers to park easily and give providers access to wide range of downtime activities in one place.  
• “Front stage” downtime activities may conflict with other users’ constructions of the appropriate use of urban space and create conflicts between EMS providers and local business owners and residents. |

<table>
<thead>
<tr>
<th>Question 2</th>
<th>Describe the ways in which dispatch information and providers’ subjective frames inform impressions of particular calls before EMS providers arrive on-scene.</th>
</tr>
</thead>
</table>
| Relevant Findings | • Providers use information about both dispatch information (e.g. “man down” calls) and location (particularly in the Midtown neighborhood) to assess whether a call will be for a “frequent flier” or for a “1-37D” patient.  
• Use of dispatch information in this way may pre-dispose providers to “getting burned” if they are primed to anticipate one type of patient or set of symptoms. |

<table>
<thead>
<tr>
<th>Question 3</th>
<th>Identify the types of work, focusing on non-medical “street level social work” that EMS providers engage in and describe the neighborhood conditions and context within which this work occurs.</th>
</tr>
</thead>
</table>
| Relevant Findings | • Providers believe that much of their work is non- or sub-acute in nature, a belief supported by analysis of dispatch information.  
• Of the five overarching types of “grunt work” identified by providers, they perceive substance use calls and calls for patients who are homeless to have the greatest degree of spatial concentration. |
The spatial patterning identified by providers is not explained by demographic variation between Census Block Groups nor is it fully explained by measures of where dispatch information indicates these types of calls take place. Providers’ focus on “street level social work” helps to explain the discord between how providers perceive the overall spatial distribution of their work and the “objective” measure of where EMS work takes place in Chapman.

EMS work clusters in particular neighborhoods within the City of Chapman; this is termed the “Midtown Effect”. Clustering of EMS work is perceived by providers to be the result of “grunt work” with patients who are homeless and have substance use issues. The “Midtown Effect” is the result of both a presence of resources that cater to homeless individuals and those with substance use issues as well as Midtown Plaza’s geographic location midway between the safety net hospital (the Mather Hospital) and the “wet shelter”.

<table>
<thead>
<tr>
<th>Chapter 3 (con’t)</th>
<th>Research Question</th>
<th>Relevant Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>see previous page</td>
<td>• The spatial patterning identified by providers is not explained by demographic variation between Census Block Groups nor is it fully explained by measures of where dispatch information indicates these types of calls take place. • Providers’ focus on “street level social work” helps to explain the discord between how providers perceive the overall spatial distribution of their work and the “objective” measure of where EMS work takes place in Chapman.</td>
<td></td>
</tr>
</tbody>
</table>

| Question 4 | Evaluate the spatial patterning of EMS calls and the effect that social and neighborhood conditions have on this process. | • EMS work clusters in particular neighborhoods within the City of Chapman; this is termed the “Midtown Effect”. • Clustering of EMS work is perceived by providers to be the result of “grunt work” with patients who are homeless and have substance use issues. • The “Midtown Effect” is the result of both a presence of resources that cater to homeless individuals and those with substance use issues as well as Midtown Plaza’s geographic location midway between the safety net hospital (the Mather Hospital) and the “wet shelter”. |
FIGURE 9.2 - Lake County, Florida Public Education Billboard

Source: photo via Google Images; credit unknown
### TABLE 9.3 - Sensitivity and Specificity of Select Medical Priority Dispatch Codes

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rate</td>
<td>95% CI</td>
</tr>
<tr>
<td>Overdose/Posioning</td>
<td>78.4</td>
<td>76.4-80.2</td>
</tr>
<tr>
<td>Psych/Suicide</td>
<td>5.5</td>
<td>4.3-7.0</td>
</tr>
<tr>
<td>Unconscious/Unresponsive</td>
<td>97.5</td>
<td>97.2-97.9</td>
</tr>
<tr>
<td>Unknown Problem/Man Down</td>
<td>8.9</td>
<td>7.6-10.4</td>
</tr>
</tbody>
</table>

*Source: Fledman et al. 2006, study of the Toronto, Canada Emergency Medical Services system*
APPENDIX A: Summary of EMS Providers

A.1. Participation Status of Providers
A.2. Gender of Participating Providers
A.3. Level of Certification for Participating Providers
A.4. Years of EMS Experience for Participating Providers
### APPENDIX A

#### TABLE A.1. - Participation Status of Providers

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations Only</td>
<td>2</td>
<td>6.25</td>
<td>6.25</td>
</tr>
<tr>
<td>Interviews Only</td>
<td>4</td>
<td>12.50</td>
<td>18.75</td>
</tr>
<tr>
<td>Both Observations and Interviews</td>
<td>26</td>
<td>81.25</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

*Source:* Based on consent records for both the EMS shift observation and semi-structured interview phases of data collection.

#### TABLE A.2. - Gender of Participating Providers

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>10</td>
<td>31.25</td>
<td>31.25</td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>68.75</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

*Source:* Based on EMS shift observation field notes and semi-structured interview transcripts.

#### TABLE A.3. - Level of Certification for Participating Providers

<table>
<thead>
<tr>
<th>Certification Level</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Medical Technician</td>
<td>7</td>
<td>21.88</td>
<td>21.88</td>
</tr>
<tr>
<td>Paramedic</td>
<td>25</td>
<td>78.12</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

*Source:* Based on EMS shift observation field notes and semi-structured interview transcripts.
### TABLE A.4. - Years of EMS Experience for Participating Providers

<table>
<thead>
<tr>
<th>Experience Range</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 4 years</td>
<td>15</td>
<td>46.88</td>
<td>46.88</td>
</tr>
<tr>
<td>5 to 9 years</td>
<td>12</td>
<td>37.50</td>
<td>84.38</td>
</tr>
<tr>
<td>10 to 14 years</td>
<td>3</td>
<td>9.38</td>
<td>93.75</td>
</tr>
<tr>
<td>15 or more years</td>
<td>2</td>
<td>6.25</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Based on EMS shift observation field notes and semi-structured interview transcripts.*
APPENDIX B: Statistics for Key Variables

B.1. Total EMS Incidents by Census Block Group 333
B.2. Frequent Call Clusters by Census Block Group 335
B.3. Homeless Clusters by Census Block Group 337
B.4. Substance Use Clusters by Census Block Group 339
B.5. Psychiatric Call Clusters by Census Block Group 341
B.6. Non-Acute Call Clusters by Census Block Group 344
B.7. Chronic Illness Call Clusters by Census Block Group 347
Variable B.1:  Total EMS Incidents by Census Block Group
Data Source:  Chapman Police Department Calls for Service

Percentiles

\[
\begin{array}{ccc}
\text{Percentile} & \text{Observations} & \text{Percentile Value} \\
1\% & 35 & 35 \\
5\% & 47 & \\
10\% & 71 & 71 \\
25\% & 111.5 & 111.5 \\
50\% & 230.5 & 230.5 \\
75\% & 484 & 484 \\
90\% & 822 & 822 \\
95\% & 951 & 951 \\
99\% & 1727 & 1727 \\
\end{array}
\]

Observations: \( \approx 90 \)
Minimum: 35
Maximum: 
Mean: 347.5227
Std. Dev.: 338.0966
Variance: 114309.3
Skewness: 1.956241
Kurtosis: 7.312025

Figure B.1a: Histogram
Variable B.1:  Total EMS Incidents by Census Block Group (con’t)

Figure B.1b: Q-Q Plot

Shapiro-Wilk Test:

<table>
<thead>
<tr>
<th>Observations</th>
<th>≈90</th>
<th>H₀: Data are drawn from a population that is normally distributed</th>
</tr>
</thead>
<tbody>
<tr>
<td>W:</td>
<td>0.78628</td>
<td></td>
</tr>
<tr>
<td>V:</td>
<td>15.868</td>
<td></td>
</tr>
<tr>
<td>z:</td>
<td>6.089</td>
<td>Hₐ: Data are drawn from a population that is not normally distributed</td>
</tr>
<tr>
<td>Prob. &gt; z:</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>
Variable B.2:  **Frequent Call Clusters by Census Block Group**

Data Source:  Semi-Structured Interview Sketch Map

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Observations</th>
<th>Observations:</th>
<th>Observations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>0</td>
<td>≈90</td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td>1</td>
<td>Minimum:</td>
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</tr>
<tr>
<td>25%</td>
<td>3</td>
<td>Maximum:</td>
<td>36</td>
</tr>
<tr>
<td>50%</td>
<td>5</td>
<td>Mean:</td>
<td>8.602273</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Std. Dev.:</td>
<td>9.448639</td>
</tr>
<tr>
<td>75%</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90%</td>
<td>28</td>
<td>Variance:</td>
<td>89.27678</td>
</tr>
<tr>
<td>95%</td>
<td>31</td>
<td>Skewness:</td>
<td>1.526241</td>
</tr>
<tr>
<td>99%</td>
<td>36</td>
<td>Kurtosis</td>
<td>4.103373</td>
</tr>
</tbody>
</table>

Figure B.2a: Histogram
Variable B.2:  Frequent Call Clusters by Census Block Group (con’t)

Figure B.2b: Q-Q Plot

Shapiro-Wilk Test:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations:</td>
<td>≈90</td>
</tr>
<tr>
<td>H₀: Data are drawn from a population that is normally distributed</td>
<td></td>
</tr>
<tr>
<td>W:</td>
<td>0.75949</td>
</tr>
<tr>
<td>V:</td>
<td>17.857</td>
</tr>
<tr>
<td>z</td>
<td>6.349</td>
</tr>
<tr>
<td>Hₐ: Data are drawn from a population that is not normally distributed</td>
<td></td>
</tr>
<tr>
<td>Prob. &gt; z:</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Variable B.3: **Homeless Call Clusters by Census Block Group**

Data Source: Semi-Structured Interview Sketch Map

<table>
<thead>
<tr>
<th>Percentiles</th>
<th>Observations</th>
<th>1%</th>
<th>0</th>
<th>5%</th>
<th>0</th>
<th>10%</th>
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<th>25%</th>
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</thead>
<tbody>
<tr>
<td>50%</td>
<td>Mean:</td>
<td>1</td>
<td>5.613636</td>
<td>Std. Dev.:</td>
<td>9.115393</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75%</td>
<td>Variance:</td>
<td>6</td>
<td>83.09039</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90%</td>
<td>Skewness:</td>
<td>23</td>
<td>1.593138</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95%</td>
<td>Kurtosis:</td>
<td>28</td>
<td>4.00292</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>99%</td>
<td></td>
<td>30</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure B.3a: Histogram
Variable B.3:  Homeless Call Clusters by Census Block Group (con’t)

Figure B.3b: Q-Q Plot

Shapiro-Wilk Test:

Observations:  ≈90  
W: 0.71233  
V: 21.358  
z 6.744  
Prob. > z: 0.000

H₀: Data are drawn from a population that is normally distributed

Hₐ: Data are drawn from a population that is not normally distributed
Variable B.4: Substance Use Call Clusters by Census Block Group

Data Source: Semi-Structured Interview Sketch Map

Percentiles

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Value</th>
<th>Observations:</th>
<th>≈90</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td>0</td>
<td>Minimum:</td>
<td>0</td>
</tr>
<tr>
<td>25%</td>
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<tr>
<td>50%</td>
<td>5.0</td>
<td>Mean:</td>
<td>7.590909</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Std. Dev.:</td>
<td>8.861172</td>
</tr>
<tr>
<td>75%</td>
<td>10.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90%</td>
<td>22.0</td>
<td>Variance:</td>
<td>78.52038</td>
</tr>
<tr>
<td>95%</td>
<td>28.0</td>
<td>Skewness:</td>
<td>1.246921</td>
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<tr>
<td>99%</td>
<td>31.0</td>
<td>Kurtosis:</td>
<td>3.454342</td>
</tr>
</tbody>
</table>

Figure B.4a: Histogram
**Variable B.4: Substance Use Call Clusters by Census Block Group (con’t)**

**Figure B.4b: Q-Q Plot**

![Q-Q Plot Image]

**Shapiro-Wilk Test:**

- **Observations:** ≈90
- **W:** 0.83525
- **V:** 12.232
- **z:** 5.516
- **Prob. > z:** 0.000

- **H₀:** Data are drawn from a population that is normally distributed
- **Hₐ:** Data are drawn from a population that is *not* normally distributed
Variable B.5: Psychiatric Call Clusters by Census Block Group

Data Source: Semi-Structured Interview Sketch Map

Percentiles

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Value</th>
<th>Observations:</th>
<th>Minimum:</th>
<th>Maximum:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>0</td>
<td>≈90</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>5%</td>
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<td></td>
</tr>
<tr>
<td>50%</td>
<td>3</td>
<td>Mean: 4.034091</td>
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<td></td>
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<tr>
<td>75%</td>
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<td>Std. Dev.: 3.82505</td>
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<td></td>
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<td>90%</td>
<td>11</td>
<td>Variance: 14.63101</td>
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<tr>
<td>95%</td>
<td>12</td>
<td>Skewness: 1.034632</td>
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<td></td>
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<tr>
<td>99%</td>
<td>13</td>
<td>Kurtosis: 2.89793</td>
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</tr>
</tbody>
</table>

Figure B.5a: Histogram
Variable B.5: Psychiatric Call Clusters by Census Block Group (con’t)

Figure B.5b: Q-Q Plot

Shapiro-Wilk Test:

- Observations: ≈90
- W: 0.87094
- V: 9.583
- z: 4.978
- Prob. > z: 0.000

H₀: Data are drawn from a population that is normally distributed.
Hₐ: Data are drawn from a population that is not normally distributed.
Variable B.5:  Psychiatric Call Clusters by Census Block Group (con’t)

Figure B.5c: Choropleth Map

Number of Clusters a Block Group is Included In:

- 1-4
- 5-7
- 8-10
- 11-13
Variable B.6: Non-Acute Call Clusters by Census Block Group

Data Source: Semi-Structured Interview Sketch Map

Percentiles

<table>
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<tr>
<th>Percentile</th>
<th>Value</th>
<th>Observations:</th>
<th>Observations:</th>
</tr>
</thead>
<tbody>
<tr>
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<td>≈90</td>
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</tr>
<tr>
<td>5%</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td>1</td>
<td>Minimum:</td>
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</tr>
<tr>
<td>25%</td>
<td>1</td>
<td>Maximum:</td>
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<tr>
<td>50%</td>
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<td>Mean:</td>
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<tr>
<td></td>
<td></td>
<td>Std. Dev.:</td>
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<tr>
<td>75%</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
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<tr>
<td>99%</td>
<td>13</td>
<td>Kurtosis:</td>
<td>4.48675</td>
</tr>
</tbody>
</table>

Figure B.6a: Histogram
Variable B.6: Non-Acute Call Clusters by Census Block Group (con’t)

Figure B.6b: Q-Q Plot

Shapiro-Wilk Test:

- Observations: ≈ 90
- W: 0.80148
- V: 14.739
- z: 5.927
- Prob. > z: 0.000

H₀: Data are drawn from a population that is normally distributed
Hₐ: Data are drawn from a population that is not normally distributed
Variable B.6:  Non-Acute Call Clusters by Census Block Group (con’t)

Figure B.6c: Choropleth Map

Number of Clusters a Block Group is Included In:

- 1-3
- 4-6
- 7-9
- 9-13
Variable B.7:  **Chronic Illness Call Clusters by Census Block Group**
Data Source:  Semi-Structured Interview Sketch Map

Percentiles

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Count</th>
<th>Observations:</th>
<th>≈90</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td>1</td>
<td>Minimum:</td>
<td>0</td>
</tr>
<tr>
<td>25%</td>
<td>2</td>
<td>Maximum:</td>
<td>9</td>
</tr>
<tr>
<td>50%</td>
<td>3</td>
<td>Mean:</td>
<td>3.522727</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Std. Dev.:</td>
<td>1.929667</td>
</tr>
<tr>
<td>75%</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90%</td>
<td>6</td>
<td>Variance:</td>
<td>3.723615</td>
</tr>
<tr>
<td>95%</td>
<td>7</td>
<td>Skewness:</td>
<td>0.665116</td>
</tr>
<tr>
<td>99%</td>
<td>9</td>
<td>Kurtosis:</td>
<td>3.483148</td>
</tr>
</tbody>
</table>

Figure B.7a: Histogram
Variable B.7: Chronic Illness Call Clusters by Census Block Group (con’t)

Figure B.7b: Q-Q Plot

Shapiro-Wilk Test:

Observations: ≈ 90

$W$: 0.97676

$V$: 1.726

$z$: 1.202

Prob. > $z$: 0.11468

H$_0$: Data are drawn from a population that is normally distributed

H$_A$: Data are drawn from a population that is not normally distributed

Notes:
- Royston’s (1982) alteration to the Shapiro-Wilk (1965) test, which is valid for sample sizes where $4 \leq n \leq 2000$, is used here.
- Test output are obtained using the `swilk` command in Stata.
- The Shapiro-Wilk test is utilized because of its power relative to other theory driven normality tests (Park 2008; Razali and Wah 2011).
Variable B.7: Chronic Illness Call Clusters by Census Block Group (con’t)

Figure B.7c: Choropleth Map

Number of Clusters a Block Group is Included In:

- 1-2
- 3-4
- 5-6
- 7-9
APPENDIX C: Field Note Variable Codebook

C.1. Shift Metadata 351
C.2. Downtime Event Variables 352
C.3. Emergency Call Variables 354
### C.1. Shift Metadata

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variable Label</th>
<th>Variable Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>Shift Identification Number</td>
<td>NUM; Continuous</td>
</tr>
<tr>
<td>2.00</td>
<td>Shift Day of Week</td>
<td>NUM; Binary</td>
</tr>
<tr>
<td></td>
<td><em>Values:</em> (0) Weekday; (1) Weekend</td>
<td></td>
</tr>
<tr>
<td>3.00</td>
<td>Shift Time of Day</td>
<td>NUM; Ordinal</td>
</tr>
<tr>
<td></td>
<td><em>Values:</em> (1) Day; (2) Evening; (3) Night</td>
<td></td>
</tr>
<tr>
<td>4.00</td>
<td>Provider 1 Identification Number</td>
<td>NUM; Continuous</td>
</tr>
<tr>
<td>5.00</td>
<td>Provider 1 Gender</td>
<td>NUM; Binary</td>
</tr>
<tr>
<td></td>
<td><em>Values:</em> (1) Male; (2) Female</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Notes:</em> To protect participant confidentiality due to the small sample size of providers, anyone who reports a gender identify other than male or female will be marked with a null value for “not reported”</td>
<td></td>
</tr>
<tr>
<td>6.00</td>
<td>Provider 1 Level</td>
<td>NUM; Nominal</td>
</tr>
<tr>
<td></td>
<td><em>Values:</em> (1) EMT-Basic; (2) EMT-Paramedic</td>
<td></td>
</tr>
<tr>
<td>7.00</td>
<td>Provider 1 Seniority</td>
<td>NUM; Ordinal</td>
</tr>
<tr>
<td></td>
<td><em>Values:</em> (1) &lt; 5 years; (2) 5-9 years; (3) 10-14 years; (4) &gt; 14 years</td>
<td></td>
</tr>
<tr>
<td>8.00</td>
<td>Provider 2 Identification Number</td>
<td>NUM; Continuous</td>
</tr>
<tr>
<td>9.00</td>
<td>Provider 2 Gender</td>
<td>NUM; Binary</td>
</tr>
<tr>
<td></td>
<td><em>Values:</em> (1) Male; (2) Female</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Notes:</em> To protect participant confidentiality due to the small sample size of providers, anyone who reports a gender identify other than male or female will be marked with a null value for “not reported”</td>
<td></td>
</tr>
<tr>
<td>10.00</td>
<td>Provider 2 Level</td>
<td>NUM; Nominal</td>
</tr>
<tr>
<td></td>
<td><em>Values:</em> (1) EMT-Basic; (2) EMT-Paramedic</td>
<td></td>
</tr>
<tr>
<td>11.00</td>
<td>Provider 2 Seniority</td>
<td>NUM; Ordinal</td>
</tr>
<tr>
<td></td>
<td><em>Values:</em> (1) &lt; 5 years; (2) 5-9 years; (3) 10-14 years; (4) &gt; 14 years</td>
<td></td>
</tr>
<tr>
<td>12.00</td>
<td>Shift Memo</td>
<td>TXT; String</td>
</tr>
</tbody>
</table>
## C.2. Downtime Variables

<table>
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<th>Variable Label</th>
<th>Variable Type</th>
<th>De-identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.01</td>
<td>Full Identification Number (Shift Identification Number + Event Identification Number)</td>
<td>NUM; Continuous</td>
<td></td>
</tr>
<tr>
<td>13.02</td>
<td>Shift Identification Number</td>
<td>NUM; Continuous</td>
<td></td>
</tr>
<tr>
<td>13.03</td>
<td>Event Identification Number</td>
<td>NUM; Continuous</td>
<td></td>
</tr>
<tr>
<td>14.00</td>
<td>Type of Note</td>
<td>NUM; Nominal</td>
<td></td>
</tr>
</tbody>
</table>

*Values: (0) Downtime; (1) Emergency Call*

<table>
<thead>
<tr>
<th>Var.</th>
<th>Variable Label</th>
<th>Variable Type</th>
<th>Notes: Derived variable from variables 15.01 &amp; 15.02</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.01</td>
<td>Event Start Time</td>
<td>NUM; Time</td>
<td></td>
</tr>
<tr>
<td>15.02</td>
<td>Event End Time</td>
<td>NUM; Time</td>
<td></td>
</tr>
<tr>
<td>15.03</td>
<td>Event Duration</td>
<td>NUM; Continuous</td>
<td></td>
</tr>
</tbody>
</table>

*Notes: Derived variable from variables 15.01 & 15.02*

<table>
<thead>
<tr>
<th>Var.</th>
<th>Variable Label</th>
<th>Variable Type</th>
<th>Notes: Derived variable from variable 15.01; (1) Day (0600hrs to 1459hrs); (2) Evening (1500hrs to 2259hrs); (3) Night (2300hrs to 0559hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.04</td>
<td>Time of Day</td>
<td>NUM; Nominal</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Var.</th>
<th>Variable Label</th>
<th>Variable Type</th>
<th>Notes: Derived variable, applied during data entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.00</td>
<td>Provider Driving</td>
<td>NUM; Nominal</td>
<td></td>
</tr>
<tr>
<td>17.01</td>
<td>Starting Location</td>
<td>TXT; String</td>
<td></td>
</tr>
</tbody>
</table>

*Notes: Point location (street address or intersection) when non-emergency locations are the starting place; Census Block Group identification number when a previous emergency call location is the starting place*

<table>
<thead>
<tr>
<th>Var.</th>
<th>Variable Label</th>
<th>Variable Type</th>
<th>Notes: Provider Identification Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.02</td>
<td>Starting Address</td>
<td>TXT; String</td>
<td>De-identified</td>
</tr>
</tbody>
</table>

*Notes: Point location (street address or intersection) when non-emergency locations are the starting place; Census Block Group identification number when a previous emergency call location is the starting place*

<table>
<thead>
<tr>
<th>Var.</th>
<th>Variable Label</th>
<th>Variable Type</th>
<th>Notes: Derived variable, applied during data entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.03</td>
<td>Starting City</td>
<td>NUM; Nominal</td>
<td></td>
</tr>
<tr>
<td>17.04</td>
<td>Starting Census Block Group</td>
<td>NUM; Nominal</td>
<td></td>
</tr>
<tr>
<td>Var.</td>
<td>Variable Label</td>
<td>Variable Type</td>
<td>De-identified</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------------------</td>
<td>------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>18.00</td>
<td>Driving Route from Previous Location</td>
<td>TXT; String</td>
<td>De-identified</td>
</tr>
<tr>
<td></td>
<td>Notes: Street names only recorded when outside of previous emergency call location Block Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.01</td>
<td>Downtime Location</td>
<td>TXT; String</td>
<td></td>
</tr>
<tr>
<td>19.02</td>
<td>Downtime Location Address</td>
<td>TXT; String</td>
<td></td>
</tr>
<tr>
<td>19.02</td>
<td>Downtime Location Address ID</td>
<td>NUM; Continuous</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Notes: Derived variable, applied during data entry; used for linking location to geodatabase record for GIS analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.04</td>
<td>Downtime Location City</td>
<td>NUM; Nominal</td>
<td></td>
</tr>
<tr>
<td>19.05</td>
<td>Downtime Location Census Block Group</td>
<td>NUM; Nominal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Notes: Derived variable, applied during data entry</td>
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<td></td>
</tr>
<tr>
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### C.3. Emergency Call Variables

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*Values: (0) Downtime; (1) Emergency Call*

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*Notes: Derived variable from variables 22.01 & 22.02, applied during data entry*

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<td>Values: (1135) Home/Residence; (1140) Farm; (1145) Mine or Quarry; (1150) Industrial Place and Premises; (1155) Place of Recreation or Sport; (1160) Street or Highway; (1165) Public Building; (1170) Trade or Service; (1175) Health Care Facility; (1180) Residential Institution (Nursing Home, Jail, or Prison); (1185) Lake, River, Ocean; (1190) Other Location</td>
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<td><strong>Values:</strong> (7270) Home; (7280) Hospital; (7290) Medical Office/Clinic; (7300) Morgue; (7320) Nursing Home; (7330) Other; (7340) Other EMS Responder (air); (7350) Other EMS Responder (ground); (7360) Police/Jail</td>
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Values: (330) Clean-up; (335) Decontamination; (340) Documentation; (345) ED Overcrowding; (350) Equipment Failure; (355) Equipment Replenishment; (360) None; (365) Other; (370) Staff Delay; (375) Vehicle Failure

NEMSIS v2: E02_10

| 33.00| Fieldnote Text       | TXT; String   | De-identified |
APPENDIX D: Semi-Structured Interview Guide
1. **Pre-Consent Process**
   - Desktop 1 - Interview Guide and Protocol; Audacity
   - Desktop 2 - Link File;
   - Desktop 3 - Dissertation Database

   1.1. Pull up participant’s database entry or create new participant database entry
   1.2. Isolate row in link file by bolding PID cell
   1.3. Label maps with PID number
   1.4. Create new audacity project in PID folder

2. **Consent Process**

   2.1. Give introduction to project if they are a new participant
   2.2. Note that study is voluntary/they can choose not to participant; that all data are confidential, are stored on encrypted hard drives; audio recordings are made to make sure responses are accurately transcribed & the intense looking microphone is used because I can save data directly onto the encrypted drives, and it filters out the background noise; you will receive a $20 gift card as a ‘thank you’ for participating
   2.3. If they consent, start audio recording and include PID as first part of recording (“this is interview 001”)

3. **Background [only for new participants who were not participants in the shift observation phase of data collection];**
   - FOR EXISTING PARTICIPANTS - CONFIRM DATA IN DATABASE

   3.1. What level - EMT or Medic - are you?
   3.2. How long have you been in EMS?
   3.3. Is this the only place you have worked in EMS?

   **If no, probe:**
   3.3.1. Where else have you worked?
   3.3.2. For how long?

4. **Opening**

   4.1. If you were to describe what you do on a typical shift to someone who isn’t familiar with EMS work, how would you describe it?
   4.2. How would you describe a “good” shift?
   4.3. How would you describe a “bad” shift?

5. **Downtime**

   **Into if downtime is mentioned in 3.1:**
   It is interesting you mentioned downtime.* I want to come back to the calls you’ve mentioned in a few minutes. First, though, one of the things that I have some questions about - and that I’m hoping you can help me understand a bit better - is how providers here spend their downtime. When I looked through my notes, only about 1/3rd of the time I spent here was spent on calls. I think EMS - and maybe a couple of other fields like fire fighting and police -
are interesting because that is a normal part of the workday.
*use participant's language

**Intro if downtime is not mentioned in 3.1:**
I want to come back to the calls you’ve mentioned in a few minutes. First, though, one of the things that I have some questions about - and that I’m hoping you can help me understand a bit better - is how providers here spend their downtime. When I looked through my notes, only about 1/3rd of the time I spent here was spent on calls. I think EMS - and maybe a couple of other fields like fire fighting and police - are interesting because that is a normal part of the workday.

5.1. So, to start how do you typically spend your time when you’re at work but not on calls?
5.2. How would you like to spend your time?
5.3. One thing I’ve noticed is that a lot of providers here have smartphones - do you have one?

*If yes, probe:*
5.3.1. What do you use your phone for during shifts?
5.3.2. Is that what other providers do?

5.4. Some also have tablets - like iPads or kindles - that they have with them during shifts. Do you have a tablet you bring with you?

*If yes, probe:*
5.4.1. What do you use your tablet for during shifts?
5.4.2. Is that what other providers do?

5.5. I have a map here of [Chapman] [give the participant the PARTICIPANT MAP]. Can you point out the places where you spend time when you’re not on calls?

*Mark responses on the INTERVIEWER MAP*
BLUE INK, SYMBOLS (+, ‡, ★, •, ▲, ◆, ✔)
WRITE DEFINITIONS ON MAP ITSELF

*For each place the participant indicates, probe if participant does not volunteer:*
5.5.1. What do you call that place?
5.5.2. Tell me about the time you spend there...

5.6. Are there places you don’t, or can’t, spend time?

*Mark responses on the INTERVIEWER MAP*
BLUE INK, UNUSED SYMBOLS (+, ‡, ★, •, ▲, ◆, ✔) FROM 5.5
WRITE DEFINITIONS ON MAP ITSELF

*For each place the participant indicates, probe:*
5.6.1. What do you call that place?
5.6.2. Tell me about why you don’t (can’t) spend time there.
5.6.3. **If they mention [Eaton Plaza]:** I was here when that change happened. Can you tell me what that change has been like?

6. **[Chapman] Familiarity**

6.1. Since we’ve been talking a lot about specific places in [Chapman], I’m wondering what you think of the City as a whole?

6.2. Were you familiar with the City before you started working at [Private Ambulance]?

**If yes, probe if participant does not volunteer:**

6.2.1. How much time did you spend in [Chapman] before you started working at [Private Ambulance]?

6.3. How much time do you spend in [Chapman] when you're not working?

7. **Calls**

7.1. I’d like to go back to the map again - one of the things that I’m interested in is where EMS work takes place. So, this time I’d like to know where you think you respond to calls on a regular basis?

*Mark responses on the INTERVIEWER MAP*

**RED INK, CODE (fx1, fx2, etc); WRITE DEFINITIONS ON MAP ITSELF**

*Keep track of specific call types mentioned*

*For each place the participant indicates, probe:*  
7.1.1. What do you call that place?  
7.1.2. Tell me about the calls you see there...  
7.1.3. Can you tell me how calls in this area compare to other areas of [Chapman]?

7.2. Take a look at this map *[give the participant the OBSERVATION MAP]*. This shows where I went to calls when I was riding third last year. The darker the shading - the more calls I saw. How does this map compare to where you think you respond to calls on a regular basis?

*Mark responses on the INTERVIEWER MAP*

**RED INK, CODE (fxA, fxB, etc); WRITE DEFINITIONS ON MAP ITSELF**

*Keep track of specific call types mentioned*

*If there are differences, probe:*  
7.2.1. What do you call that place?  
7.2.2. Tell me about the calls you see there...  
7.2.3. Can you tell me how calls in this area compare to other areas of [Chapman]?

7.3. When I was riding third, I noticed that there seems to be a wide variety of settings or types of places you respond to. Can you tell me about the types of locations where you respond to on a regular basis? *If stuck - I'm thinking of places like people's houses,*
apartments, hospitals, the street, and so on.

7.4. In addition to where EMS work takes place, I’m also interested in the wide variety of patients that you see. You mentioned a couple groups of patients that I’d like to know a little bit more about.

Focal patient groups (GREEN INK; WRITE DEFINITIONS ON MAP ITSELF):
(a) substance users, CODE (S1, S2, etc)
(b) mental health / psychiatric, CODE (P1, P2, etc)
(c) homeless, CODE (H1, H2, etc)
(d) “non-acute”, CODE (N1, N2, etc)
(e) chronic illness CODE (C1, C2, etc)

For group in the focal patient list that the provider also mentioned in 3.1, 5.1, 6.1, 6.2, or 6.3, probe:
7.4.1. Can you tell me a bit more about working with patients that are [focal patient group]?

7.4.2. I know you’ve already told me a couple places [indicate on the OBSERVATION MAP] - where else do you see those types of calls?

Mark responses on the INTERVIEWER MAP

7.4.3. Can you tell me if you think there is a particular reason why you see these patients in the places you see them?

7.4.4. How are calls for these types of patients typically dispatched?

7.5. Do you ever respond to calls where you know or think you know who the patient will be?

If yes, probe:
7.5.1. Can you tell me more about what that is like?

8. Closing
8.1. Since the main focus of my project is to better understand the kind of work you do, where it happens, and who it happens with, I’m wondering what else I need to know that we haven’t talked about?
APPENDIX E: Technical Notes

E.1. Conceptualization of Spatial Relationships 366
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E.3. Mapping - Design of Bivariate Choropleth Map (FIGURE 5.10) 373
E.4. Medical Priority Dispatch System 376
G.1 - Conceptualization of Spatial Relationships

Description:
Given the “fuzzy” nature of EMS providers’ sense of neighborhood, the “zone of indifference” method of conceptualizing spatial relationships is used throughout the dissertation when spatial statistics are calculated. The “zone of indifference” method combines two approaches to spatial relationships - “fixed distance” and “inverse distance”. All spatial statistics in the dissertation are calculated using polygon data (i.e. Census Block Groups). A “fixed distance” sense of spatial relationships would therefore be appropriate, particularly here because the geographical size of Census Block Groups in Chapman varies considerably. The “zone of indifference” builds off a “fixed distance” model by considering each feature (i.e. Census Block Group) to be a neighbor of every other feature. However, the impact that features that are far away have diminishes considerably as in an “inverse distance” conceptualization of spatial relationships. Given these traits, the “zone of indifference” is particularly well suited for data that meet the requirements for “fixed distance” spatial relationships where neighborhood boundaries should be not be static but rather should be allowed to fluctuate.

Selecting a Distance Band:
The “zone of indifference” concept of spatial relationships relies on the use of a distance band to determine whether features should be considered part of the “fixed distance” or “inverse distance” elements of the spatial weight formula. To determine the most accurate distance band, the Census Block Groups shape file was analyzed using the Multi-Distance Spatial Cluster Analysis tool in ArcGIS 10.2, also known as Ripley’s $k$. The Ripley’s $k$ tool uses the centroids of the given set of features to identify the area of maximum spatial autocorrelation. For each permutation, expected and observed values for Ripley’s $k$ are created and the difference between the two points is calculated. The difference between the observed and expected $k$ values peaks where there is maximum spatial autocorrelation.
For this set of features (i.e. Census Block Groups), a total of 100 permutations of Ripley’s $k$ were calculated for this analysis. The resulting difference values (DiffK) are graphed below. The difference values ‘peak’ at 3,143.353439 feet. This value is the area of maximum spatial autocorrelation and is used as the distance band for all spatial statistics calculated using Census Block Groups in ArcGIS.

FIGURE F.1 - Ripley’s $k$ DiffK values

Using Queen’s Measure:
One difference between Moran’s $I$ as implemented in ArcGIS and GeoDa is that the conceptualization of spatial relationships is different (see APPENDIX F.x for a description of the
spatial relationships used in ArcGIS). Rather than a zone of indifference, GeoDA uses a model of spatial contiguity to create the spatial weights used in the Moran's $I$ analysis. Spatial weights were created using the Queen's measure of spatial contiguity (Grubesic 2008), which offers a more comprehensive measure of contiguity than Rook or Bishop measures by incorporating both the shared boundaries and vertices of polygons when calculating the spatial weight $W$ (Anselin 1995; Grubesic 2008). The spatial weight $W$ is specified as follows:

$$W_{ij} = \frac{C_{ij}}{\sum_{j=1}^{n} C_{ij}}$$

In the above formula, $i$ and $j$ refer to polygons that may have shared vertices or boundaries. If they do have shared properties, $c_{ij}$ is equal to 1; if they do not have shared properties, $c_{ij}$ is equal to 0. This method is used for the calculation of all spatial statistics in GeoDa.
E.2. - Mapping - Color Schemes

Color Scheme Considerations:
Color schemes for the maps were selected using ColorBrewer 2.0 (Brewer and Harrower 2015), a website for selecting color palettes for cartographical applications. Individual color schemes were selected based on a number of considerations. All color schemes used are rated by ColorBrewer 2.0 to be accessible for readers who are colorblind. Additionally, color schemes were selected that would be compatible with LCD computer displays and color printing. Finally, schemes were selected based on their compatibility with the black colored border used on city maps as well as the white background used both around the map and for null values.

Technical Considerations:
The original data were mapped using ArcGIS 10.2. These maps were used to guide the construction of publication graphics using the “alternative cartography” basemap described in APPENDIX F.x. All publication maps were using the vector image editing software OmniGraffle 6. Hex triplet colors were specified using the Skala Color Picker utility for OS X.

Color Schemes:
The following color schemes are used for maps in this dissertation. Two 4-class color schemes and two 5-class color schemes were selected for publication along with a divergent color scheme for use with the Getis-Ord GI* output. A sixth color scheme, for bivariate maps, is described in APPENDIX F.3.
FIGURE F.2 - Color Scheme 1 - 4-Class Blue-Purple with Associated HEX Color Values

Notes: Used in Figure 7.6, Figure 8.3

FIGURE F.2 - Color Scheme 2 - 4-Class Yellow-Green with Associated HEX Color Values

Notes: Used in Figure B.5c, Figure B.6c, and Figure B.7c

FIGURE F.3 - Color Scheme 3 - 5-Class Red-Purple with Associated HEX Color Values

Notes: Used in Figure 4.1, Figure 4.2, and Figure 4.3
FIGURE F.5 - Color Scheme 4 - 5-Class Purple-Red with Associated HEX Color Values

Notes: Used in Figure 5.2

![Color Scheme 4](image)

FIGURE F.6 - Color Scheme 5 - 5-Class Yellow-Green with Associated HEX Color Values

Notes: Used in Figure 5.6 and Figure 7.11

![Color Scheme 5](image)

FIGURE F.7 - Color Scheme 6 - 3-Class Purple-Blue with Associated HEX Color Values

Notes: Used in Figure 8.1

![Color Scheme 6](image)
FIGURE F.8 - Color Scheme 7 - 5-Class Divergent Red-Blue with Associated HEX Color Values

Notes: Used in Figure 5.4, Figure 5.7, Figure 7.7, Figure 7.12, and Figure 8.4
E.3. - Mapping - Design of Bivarite Choropleth Map (FIGURE 5.10)

**Description:**

Bivarite choropleth maps (also known as thematic maps) provide a visual means for comparing the spatial distribution of two variables. They are one type of a broader family of bivariate maps that use a variety of symbol sizes and hues to differentiate between two variables presented visually (Elmer 2012). Bivariate maps have greater visual complexity than univariate maps, which can limit readers’ ability to correctly interpret and evaluate the data presented. Careful attention should therefore be paid to the symbology of the map so as not to obscure or inadvertently emphasize certain data values (Hope and Hunter 2007). Additionally, bivariate choropleth maps are technically more difficult to create. They require a series of data transformations in order to create the 9 or 12 data classes used to represent the data (Stevens 2015). Finally, color selection is important for these maps since the resulting blend of two or more colors may make the map difficult to read for those who are color blind, and may not transfer well to certain computer screens or when photo copied (Stevens 2015). The following sections detail the implementation of the bivariate choropleth map for FIGURE 5.10, which compares the distribution of the EMS incidents in a given Census Block Group to the level of endorsement that providers made about whether the given Census Block Group was the site of frequent responses.

**Stata Code:**

The following code is shared to give readers a sense of how the variable “bi_scale” was created. Sharing code used to produce elements of research that are novel or critical to an empirical work is becoming increasingly common, and this code is shared here in the spirit of that movement (Baggerly and Barry 2011; Barnes 2012; LeVeque 2012). Though the variables and local macros are idiosyncratic to this study, the following Stata 12 code can be used for replicating the process used to develop the bivarite map.
Definitions:
emd_total = EMS Incidents variable
m_freq = Provider Perceptions of Frequent Responses variable
bi_scale = new variable with a range of 1 to 9 that locates each Census Block Group on the 3x3 table used for creating the bivariate choropleth map

Code:

summarize emd_total
local emd_mean = r(mean)
local emd_sd = r(sd)

summarize m_freq
local freq_mean = r(mean)
local freq_sd = r(sd)

generate bi_scale = .
replace bi_scale = 1 if (emd_total <= `emd_mean')
  & (m_freq <= `freq_mean')
replace bi_scale = 2 if (emd_total <= `emd_mean')
  & (m_freq > `freq_mean' & m_freq <= (`freq_mean' + `freq_sd'))
replace bi_scale = 3 if (emd_total <= `emd_mean')
  & (m_freq > (`freq_mean' + `freq_sd'))

replace bi_scale = 4 if (emd_total > `emd_mean'
  & emd_total <= (`emd_mean' + `emd_sd')) & (m_freq <= `freq_mean')
replace bi_scale = 5 if (emd_total > `emd_mean'
  & emd_total <= (`emd_mean' + `emd_sd')) & (m_freq > `freq_mean' & m_freq <= (`freq_mean' + `freq_sd'))
replace bi_scale = 6 if (emd_total > `emd_mean'
  & emd_total <= (`emd_mean' + `emd_sd'))
  & (m_freq > (`freq_mean' + `freq_sd'))

replace bi_scale = 7 if (emd_total > (`emd_mean' + `emd_sd'))
  & (m_freq <= `freq_mean')
replace bi_scale = 8 if (emd_total > (`emd_mean' + `emd_sd'))
  & (m_freq > `freq_mean' & m_frequent <= (`freq_mean' + `freq_sd'))
replace bi_scale = 9 if (emd_total > (`emd_mean' + `emd_sd'))
  & (m_freq > (`freq_mean' + `freq_sd'))
**Map Design:**

Stevens (2015) provides several possible color schemes that could be used. My approach is an alteration of one of his designs that changes the three cells where there is agreement between the two variables from having a color shade to being white. This has the effect of accenting the cells where there is disagreement.

**FIGURE F.9 - Color Schemes for Bivariate Choropleth Maps with Associated HEX Color Values**

<table>
<thead>
<tr>
<th>Stevens (2015)</th>
<th>Current Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td></td>
</tr>
<tr>
<td>#be64ac</td>
<td>#be64ac</td>
</tr>
<tr>
<td>#8c62aa</td>
<td>#8c62aa</td>
</tr>
<tr>
<td>#3b4994</td>
<td>#ffffff</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td></td>
</tr>
<tr>
<td>#dfb0d6</td>
<td>#dfb0d6</td>
</tr>
<tr>
<td>#a5add3</td>
<td>#ffffff</td>
</tr>
<tr>
<td>#569ab9</td>
<td>#569ab9</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td></td>
</tr>
<tr>
<td>#e8e8e8</td>
<td>#ffffff</td>
</tr>
<tr>
<td>#ace434</td>
<td>#5ac8c8</td>
</tr>
<tr>
<td>#5ac8c8</td>
<td></td>
</tr>
</tbody>
</table>
E.3. - Medical Priority Dispatch System

Medical Priority Dispatch System codes (MPDS), which are also referred to as Emergency Medical Dispatch codes (EMD), were used here to identify EMS calls in the Chapman Police Department’s calls for service dataset (see CHAPTER 3, p. 62). In the original dataset, they could be identified because they included a letter and the number as part of the incident description (see TABLE F.10). Using a master list of MPDS codes, the original text was crosswalked and parsed so that each string of original text was associated with the proper MPDS code. Once the MPDS codes were applied, additional information from each code was added to the call for service record, including the chief complaint and determinant text.

<table>
<thead>
<tr>
<th>Original Text</th>
<th>MPDS Chief Complaint — Determinant Text</th>
<th>MPDS Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALLERGY D4</td>
<td>Allergies/Envenomations — Snakebite</td>
<td>2-D-4</td>
</tr>
<tr>
<td>CARDIAC E1</td>
<td>Cardiac or Respiratory Arrest/Death — Not breathing at all</td>
<td>9-E-1</td>
</tr>
<tr>
<td>PSYCH/SUICID B1</td>
<td>Psychiatric/Abnormal Behavior/Suicide Attempt — Serious hemorrhage</td>
<td>25-B-1</td>
</tr>
<tr>
<td>MAN DOWN B3</td>
<td>Unknown Problem (Man Down) — Unknown status/other codes not applicable</td>
<td>32-B-3</td>
</tr>
</tbody>
</table>

MPDS codes have three parts - a number, then a letter, then a number. In TABLE F.10, the codes in the righthand column are all examples of these. The first number is the protocol number, which refers to one of 32 chief medical complaints that appear in the Chapman Police Department’s calls for service dataset. The MPDS system also has several additional protocol numbers that did not appear in the dataset. Each MPDS protocol card contains a series of questions that 9-1-1 call takers ask a caller to determine the severity of the injured or sick person’s medical need. Based on how the questions are answered, a determinant level is
assigned. This determinant level is the letter that appears in the middle of the MPDS code. There are a total of six determinant letters used by the 9-1-1 center in Chapman, which are detailed in TABLE F.11. There is some local variation here, with certain areas of the United States opting not to use the Omega code.

### TABLE F.11 - MPDS Determinant Levels

<table>
<thead>
<tr>
<th>Original Text</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMEGA</td>
<td>Lowest, Basic Life Support</td>
</tr>
<tr>
<td>ALPHA</td>
<td>Basic Life Support</td>
</tr>
<tr>
<td>BRAVO</td>
<td>Basic Life Support</td>
</tr>
<tr>
<td>CHARLIE</td>
<td>Advanced Life Support</td>
</tr>
<tr>
<td>DELTA</td>
<td>Advanced Life Support</td>
</tr>
<tr>
<td>ECHO</td>
<td>Most Serious, Advanced Life Support, generally reserved for calls where the patient may not be breathing</td>
</tr>
</tbody>
</table>

A more specific description of the call is also applied, which is known as the determinant descriptor. This is referenced by the third and final number in the MPDS code. A total of 344 different combinations of chief complaints, determinant codes, and determinant descriptors were used to parse the Chapman Police Department’s data. The chief complaints and protocol numbers are listed in TABLE F.12. An example of the way a chief complaint is broken down in the MPDS system can be found on TABLE 7.5, where the Psychiatric / Abnormal Behavior / Suicide Attempt code is described in-depth. Taken as a whole, MPDS codes make it possible to identify detailed information about the way the call was categorized by the 9-1-1 call takers.
# TABLE F.12 - MPDS Chief Complaint Codes

<table>
<thead>
<tr>
<th>Card</th>
<th>Chief Complaint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abdominal Pain/Problems</td>
</tr>
<tr>
<td>2</td>
<td>Allergies/Envenomations</td>
</tr>
<tr>
<td>2</td>
<td>Animal Bites/Attacks</td>
</tr>
<tr>
<td>4</td>
<td>Assault/Sexual Assault</td>
</tr>
<tr>
<td>5</td>
<td>Back Pain (Non-Traumatic or Non-Recent Trauma)</td>
</tr>
<tr>
<td>6</td>
<td>Breathing Problems</td>
</tr>
<tr>
<td>7</td>
<td>Burns/Explosion</td>
</tr>
<tr>
<td>8</td>
<td>Carbon Monoxide/Inhalation/HAZMAT/CBRN</td>
</tr>
<tr>
<td>9</td>
<td>Cardiac or Respiratory Arrest/Death</td>
</tr>
<tr>
<td>10</td>
<td>Chest Pain (Non-Traumatic)</td>
</tr>
<tr>
<td>11</td>
<td>Choking</td>
</tr>
<tr>
<td>12</td>
<td>Convulsions/Seizures</td>
</tr>
<tr>
<td>13</td>
<td>Diabetic Problems</td>
</tr>
<tr>
<td>14</td>
<td>Drowning (near)/Diving/SCUBA Accident</td>
</tr>
<tr>
<td>15</td>
<td>Electrocution/Lightning</td>
</tr>
<tr>
<td>16</td>
<td>Eye Problems/Injuries</td>
</tr>
<tr>
<td>17</td>
<td>Falls</td>
</tr>
<tr>
<td>18</td>
<td>Headache</td>
</tr>
<tr>
<td>19</td>
<td>Heart Problems/AICD</td>
</tr>
<tr>
<td>20</td>
<td>Heat/Cold Exposure</td>
</tr>
<tr>
<td>21</td>
<td>Hemorrhage/Laceration</td>
</tr>
<tr>
<td>22</td>
<td>Inaccessible Incident/Other Entrapments (Non-Vehicle)</td>
</tr>
<tr>
<td>23</td>
<td>Overdose/Poisoning (Ingestion)</td>
</tr>
<tr>
<td>24</td>
<td>Pregnancy/Childbirth/Miscarriage</td>
</tr>
<tr>
<td>25</td>
<td>Psychiatric/Abnormal Behavior/Suicide Attempt</td>
</tr>
<tr>
<td>26</td>
<td>Sick Person (Specific Diagnosis)</td>
</tr>
<tr>
<td>27</td>
<td>Stab/Gunshot/Penetrating Trauma</td>
</tr>
<tr>
<td>28</td>
<td>Stroke (CVA)/Transient Ischemic Attack (TIA)</td>
</tr>
<tr>
<td>29</td>
<td>Traffic/Transportation Incidents</td>
</tr>
<tr>
<td>30</td>
<td>Traumatic Injuries (Specific)</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>31</td>
<td>Unconscious/Fainting (Near)</td>
</tr>
<tr>
<td>32</td>
<td>Unknown Problem (Man Down)</td>
</tr>
</tbody>
</table>