THE FORGOTTEN COLD WAR: THE NATIONAL FALLOUT SHELTER SURVEY AND THE ESTABLISHMENT OF PUBLIC SHELTERS

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The Forgotten Cold War: The National Fallout Shelter Survey and the Establishment of Public Shelters.

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ABSTRACT

The National Fallout Shelter Survey and Marking Program (NFSS) was a 1961 Kennedy Administration program that, with the help of local architect and engineering companies, located public community fallout shelters in the existing built environment. The shelter spaces were marked, stocked, and mapped. Community Shelter Plans showing the location of available shelters in the area were made with the help of local and state planning personnel. These civil defense shelters were thought to be not only essential to the survival of Americans but an important part of the United States National Defense policy. The public shelters represent a unique part of America's Cold War history and the civilian Cold War experience. Though many public shelters were located in buildings constructed during the late eighteenth and early nineteenth centuries, this thesis argues that these buildings are a type of Cold War-era resource, one that is distinguished by its use and not its appearance. The thesis includes an examination of the NFSS program nationwide as well as a focused historic context of Denver, Colorado's civil defense program; an analysis of NFSS types; and a case for the preservation of public community fallout shelters.

The form and content of this abstract are approved. I recommend its publication.

Approved: Christopher Koziol

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CHAPTER I

INTRODUCTION

This study endeavors to understand and document the history and implementation of the National Fallout Shelter Survey and Marking (NFSS) program in American cities and to make a case for the recognition of public fallout shelters as historically significant Cold War-era resources. The NFSS was a national program created by the Kennedy Administration in 1961 at a time when fear of nuclear attack was high. The program was designed to locate fallout shelter space in existing building stock, mark the shelters, and provide two weeks' worth of food, water, and other supplies for each location identified. The distinctive fallout shelter signs designed for NFSS shelters (Figure 1) were commonplace in American media during the Cold War and are ubiquitous today as a symbol of nuclear fear. Although the NFSS resulted in the designation of thousands of public community fallout shelters, there has been very little scholarship on the program and the impacts it had on communities and on the built environment of the city. Civil defense during the Cold War was omnipresent and a substantial aspect of the program, from the first Soviet atomic test in 1949 to the first Strategic Arms Limitation Talks (SALT) in 1967, was the concept of sheltering in place. However, significant Cold War and civil defense studies such as *Fallout Shelter: Designing for Civil Defense in the Cold War* by Daniel Monteyne, *One Nation Underground: The Fallout Shelter in American Culture* by Kenneth Rose, and *Stages of Emergency: Cold War Nuclear Defense* by Tracy Davis include only a brief mention of the NFSS in their discussion of public community shelters. Military studies on Cold War themes and resources also fail to discuss public fallout shelters or the NFSS program which former Secretary of Defense Robert McNamara called "an integral and essential part of our overall defense posture."[1] The 2011 National Park Service National Historic Landmark theme study, *Protecting*

[1] Kathleen Sperry, "Fallout Shelter Survey: Civil Defense Says There Is No Place Like Home," *Science* 158 No. 3803 (1967): 895.

America: Cold War Defensive Sites[2] lists fallout shelters as a Cold War related property type but does not discuss the NFSS or public fallout shelters. These books, articles, management documents, and studies consistently focus on purpose built fallout shelters and do not recognize that although public community shelters identified by the NFSS do not look like typical Cold War architecture, they are significant Cold War-era resources distinguished by their history and their use.

Figure 1. Official Fallout Shelter Sign.

[2] John S. Salmon, *Protecting America: Cold War Defensive Sites A National Historic Landmark Theme Study*, (Washington D.C: U.S. Department of the Interior, 2011).

The NFSS is distinctive in that it included an examination of architecture, engineering, demographics, politics, and settlement patterns. This allows for a unique investigation of an important part of Cold War history. By 1969, NFSS programs existed in 4,391 locations with many city and county civil defense offices managing their own programs as well as those in rural areas. In the first decade of the NFSS program the Department of Defense (DoD) appropriated more than $958 million to the Office of Civil Defense (OCD). This resulted in 95,797 marked and stocked public community shelters across the nation, providing shelter for 93 million people, with an additional 98,000 shelters waiting for marking and supplies.[3] The NFSS represents a huge Cold War undertaking and to date, none of the shelters identified by the 1960s surveys have been recognized as significant by the National Park Service's National Register of Historic Places (NRHP) program. The NRHP is an official list of buildings, sites, structures, and objects that are identified as being worthy of preservation. These represent components of the American experience and include a diverse selection of resources, including cemeteries, architecturally significant buildings, downtown historic districts, archaeological sites, locations associated with significant historical figures, farms and ranches, engineering features such as bridges and dams, and battlefield monuments. Though NFSS shelters would most certainly meet NRHP significance requirement criteria, there has been no survey of these resources that were once considered essential to human survival.

Cold War history has been undergoing a renaissance as of late, in part because of renewed aggressiveness of the United States' Cold War adversary Russia, but also because events that occurred during the early Cold War (1945–1970) have begun to resonate in history. The National Park Service, when implementing the NRHP in 1966, established a 50-year rule requiring, in most cases, that properties must be 50 years or older to be listed in the NRHP. This was done to allow for the appropriate historical perspective to determine which resources were

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[3] Department of Defense, "Status of the Civil Defense Program, April 1969," FEMA website. http://training.fema.gov/hiedu/docs/historicalinterest/office%20of%20civil%20defense%20-%20april%201969%20-%20status%20of%20the%20civil%20defense%20program.pdf.

worthy of listing. The half-century rule permits emotions surrounding the immediacy of an event to dissipate before determining the long term significance of a site, location, or building; however, it is also a period of time that allows for the public to appropriately reflect on the impact or role of an event or moment in time. This is what is happening with Cold War history today. Federal agencies are examining resources associated with Cold War events, cities are beginning to study Cold War suburban development, and there is recognition of the importance and influence of the Cold War on current public policy.

So why are NFSS public community shelters important and what makes them worthy of preservation? In addition to the ubiquity of the shelters throughout American cities and their lack of recognition on a national, state, or local level, the shelters represent an exceptional American experience. The shelters themselves were chosen for their specific locations and architectural/engineering traits and were to be used for a singular purpose, the protection of American citizens. They do not fit the archetype of Cold War-architecture in appearance; however, preservationists and historians must look past construction dates and architectural styles and recognize that the NFSS public shelters are a significant and overlooked Cold War-era resource.

These public community shelters give insight not only into American history but also into the built environment of the 1960s, a time when many cities were undergoing radical change. Central business districts (CBDs) were the undisputed centers of urban life until the decentralization of downtowns following the end of World War II. The increase in home ownership, the development of the suburb, the rise of the automobile, and the construction of the interstate system all led to a dwindling urban population. These same factors would play a role in American civil defense policy, influencing decisions on whether to evacuate cities or shelter in place, whether to encourage the construction of private shelters or pay for the building of public shelters, and even where to locate federal and defense-related businesses and offices.

To best understand the significance of the NFSS and its role in American Cold War history, a historic context must be developed. The National Park Service defines a historic context

as “those patterns or trends in history by which a specific occurrence, property, or site is understood and its meaning (and ultimately its significance) within history or prehistory is made clear.”[4]

This thesis will serve as a general historic context for the NFSS, gathering information and evaluating it so that future researchers can identify planning and protection strategies for specific public community fallout shelter resources. It will then focus on the Denver, Colorado, NFSS program explicitly. Denver was chosen because the city had a robust civil defense program and most of the records have been archived. Shelter surveys completed in Denver as part of the NFSS were typical and thus provide a good framework for understanding how the program functioned; however, like most civil defense programs, Denver’s evolved as local and statewide circumstances influenced the program. Examples of public community shelters in Denver, Colorado, will also be included to better explicate the type of resources that exist nationwide.

Literature Review

The Cold War refers to the period of time between the end of World War II and the dissolution of the Union of Soviet Socialist Republics (USSR) in 1991. Since the turn of the twenty-first century scholarship on the Cold War has dramatically increased with the establishment of journals[5] dedicated to this era and well as the publication of scholarly texts[6] with reference to Cold War-era themes. There is a smaller, but rapidly growing, collection of literature that studies civil defense during the Cold War. These resources include political analysis of the civil defense program in the United States as found in Wigner’s book, *Who Speaks For Civil Defense?*; the impacts of civil defense in the American culture as found in Zeman and Amundon’s

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[4] National Park Service, “National Register Bulletin No. 15,” accessed May 2014, http://www.nps.gov/nR/publications/bulletins/nrb15/.

[5] *The Journal of Cold War Studies* was begun in 1999 and *Cold War History* began in 2000.

[6] These include theses, dissertations, and books. A majority are dedicated to military history and/or political historic of the Cold War.

collection of essays *Atomic Culture: How We Learned to Stop Worrying and Love the Bomb* and Rose's *One Nation Underground*; and collections of civil defense literature generated during the era such as Scheibach's "*In Case Atom Bombs Fall": An Anthology of Governmental Explanations, Instructions and Warnings from the 1940s to the 1960s*. Literature discussing the architecture of fallout shelters is limited to a dissertation and 2011 book by Daniel Monteyne, *Fallout Shelter: Designing for Civil Defense in the Cold War*, and even this has less than a chapter dedicated to the NFSS program.

The most relevant collection of literature regarding the NFSS are primary source documents located at archives and libraries throughout the United States. Records of the OCD and its predecessors (1947–1972) are located at the National Archives and Records Administration (NARA) in College Park, Maryland, with smaller collections located at NARA regional archives in Chicago, Illinois; Fort Worth, Texas; and Denver, Colorado. A collection of civil defense and NFSS documents are also available at the U.S. Fire Administration Library, a repository for many emergency management related documents. Individual states and cities often have NFSS records such as those found at the Western History and Genealogy Department at the Denver Public Library; the Dallas Municipal Archives; and the Texas/Dallas History & Archives Division at the Dallas Public Library. These primary sources include memoranda, letters, and documents discussing the establishment and operation of the survey and marking program; booklets detailing how to survey and evaluate potential fallout shelter sites; pamphlets, filmstrips, and photographs designed to educate the public about the NFSS; and maps created to indicate the location of public community fallout shelters in individual cities.

CHAPTER II

CIVIL DEFENSE AND SHELTER USE DURING THE COLD WAR

Civil defense systems have changed and evolved over time as new threats have presented themselves. A critical component of these programs was, and continues to be, public acceptance. This includes volunteerism and adherence to the program. With the development of nuclear weapons in 1945, civil defense became more complicated. Protection from bomb blasts and falling debris were not enough; shelters now had to protect against radioactive fallout that could last for up to two weeks. Proper shelters had to have proper ventilation, be located nearby, and be stocked with food, water, and supplies. The high cost of constructing these types of shelters, or modifying existing shelters to meet new technical specifications, was too much for many communities.

Cold War-era civil defense programs commonly included: public and/or private shelters to protect from bombs, radiological fallout, or chemical and biological weapons; preparation for natural disasters; warning sirens and broadcast systems; patrols along the national borders; and distribution of information on emergency survival procedures.

In the United States, elation that resulted from the end of World War II was tempered by fear of the atomic weapon used to end it. The USSR tested its first atomic weapon in 1949, taking the United States by surprise. Fear built upon fear as the Soviet Union matched U.S. nuclear arms production. The first thermonuclear bomb[7], a weapon thousands of times more powerful than an atomic bomb, was tested by the United States in 1952 and by the Soviet Union in 1955. The USSR surprised the United States again by sending the first man-made satellite into space on 4 October 1957, officially beginning the space age. The thought that a Soviet device was orbiting over the country spurred the development of America's own space program and brought on a new fear—the militarization of space. For all the promises of atomic power and space

[7] The thermonuclear bomb is also referred to as a hydrogen bomb.

exploration in the fields of energy, medicine, and science there was the equal promise of destruction. A common phrase at the time was "peace…or else.[8]

This era of anxiety coupled with fascination of all things atomic was expressed in many different mediums during the Cold War. Films like 1950's *Rocketship X-M* conveyed the danger of atomic weapons on society at large, while 1958's *H-Man* and 1954's *Them!* about giant irradiated ants, played upon the fears of nuclear power.[9] Children of the Cold War played with toy Atomic Energy Labs and Atomic Energy Pistols. Tourists sent atomic postcards that displayed pictures of the destruction at Hiroshima, uranium extraction plants in Canada, mushroom clouds from the Nevada Test Site, and cooling towers at Oak Ridge, Tennessee.[10] The atomic era heavily influenced visual arts resulting in futuristic designs of cars, housewares, and clothing.

Figure 2. 1955 Uranium Rush Board Game.[11]

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[8] Michael Scheibach editor, "*In Case Atom Bombs Fall": An Anthology of Governmental Explanations, Instructions and Warnings from 1940s to 1960s* (Jefferson: McFarland & Company, Inc., 2009), 1.

[9] Ferenc M Szasz and Issei Takechi, "Atomic Heroes and Atomic Monsters: American and Japanese Cartoonists Confront the Onset of the Nuclear Age, 1945-1980," *The Historian* 69 (2007): 728-752.

[10] John O'Brian and Jeremy Borsos, *Atomic Postcards: Radioactive Messages from the Cold War* (Chicago: University of Chicago Press, 2011).

[11] Michael Amundson, "Uranium on the Cranium: Uranium Mining and Popular Culture," in *Atomic Culture: How We Learned to Stop Worrying and Love the Bomb* ed. Scott C. Zeman and Michael A. Amundson, (Boulder: University of Colorado Press, 2004), 57.

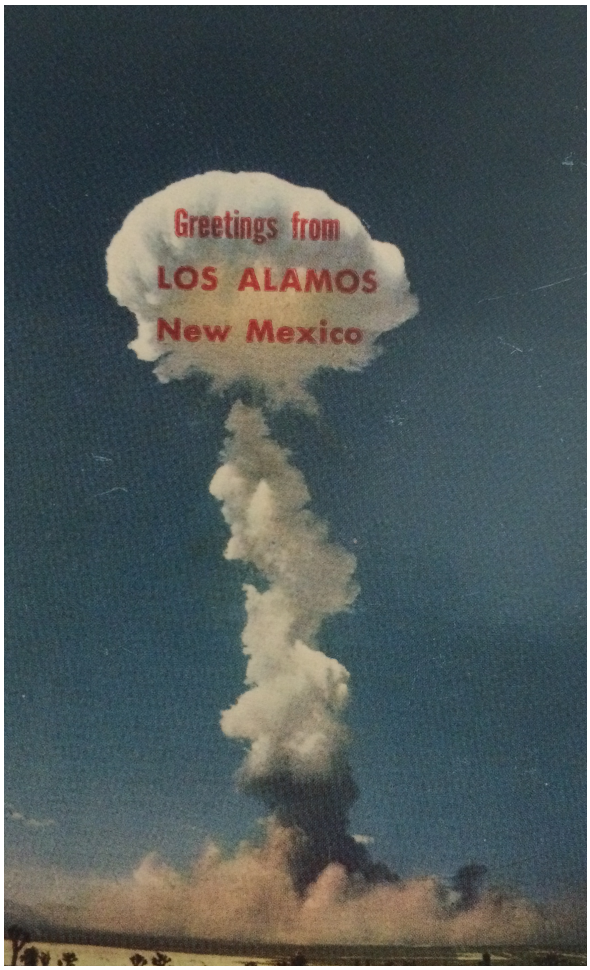

Figure 3. Postcard from Los Alamos, New Mexico.[12]

Though historic events related to the Cold War are generally associated with the U.S. military, these incidents influenced the civilian population as well. Civil defense during the Cold War was an effort to protect citizens from military attack. The tenets of civil defense in the United States included the construction of public and private bomb and fallout shelters, the identification of public spaces that can be stocked with supplies and used for public shelters, and the planning and marking of evacuation routes out of populated areas.[13]

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[12] John O'Brien and Jeremy Borsos, *Atomic Postcards* (Chicago: University of Chicago Press, 2011), 41.

[13] Kenneth D. Rose, *One Nation Underground: The Fallout Shelter in American Culture* (New York: New York University Press, 2001).

Congress passed the Federal Civil Defense Act in 1950, which created a framework for preparations to minimize the effects of an attack on U.S. civilians. Signed into law by President Harry Truman in 1951, the act created the Federal Civil Defense Administration (FCDA), outlined the government's emergency powers, and established procedures for funding state level civil defense programs. The Act stated that while the states would be required to organize most civil defense preparations, the federal government would share the costs of constructing community shelters and would provide regional stockpiles of construction materials that might not be available in an emergency situation.[14]

The initial focus of the FCDA was to disseminate information about what an "atom" is and what the effects of atomic blasts and radiation were. Certainly this was done to quell fear, but it also prepared civilians for the responsibility of civil defense. Films, posters, pamphlets, and radio broadcasts were all developed to tell civilians that they could survive a nuclear blast, if they were prepared.

[14] Wilbur Cohen and Evelyn F. Boyer, "Federal Civil Defense Act of 1950: Summary and Legislative History," *Social Security Bulletin* April (1951): 11-16.

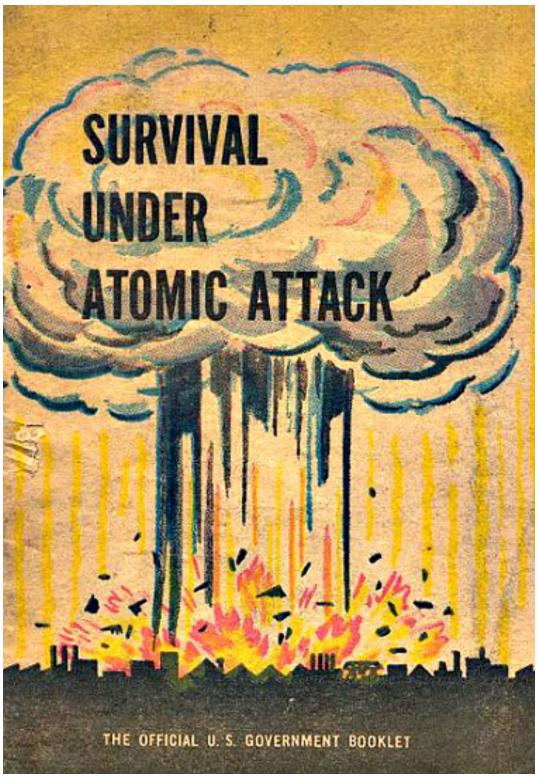

Figure 4. Civil Defense Office Booklet, 1950.[15]

The initial strategy of the FCDA was to protect the public with community shelters. The FCDA submitted a program to President Truman that would build public shelters in urban centers capable of withstanding an atomic blast. The five-year, $16 billion program was rejected.[16] As the cost of constructing new community shelters was prohibitive, the FCDA turned to the concept of citizens building private shelters, and the utilization of the current building stock as community shelters.

It was acknowledged, and publications made it clear, that there was a radius at which survival from a Hiroshima-sized blast would be possible. Total destruction would occur within one mile of ground zero, heavy damage would extend another mile, and moderate damage would

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[15] Scheibach, *In Case Atom Bombs Fall, 34.*

[16] John Phillips Resche, *Americans at War: Society, Culture, and the Homefront* (New York: Macmillan Reference USA, 2004).

extend to three miles from the blast point.[17] Private shelters were impractical within this three-mile zone but could provide protection for those living outside of it. However, unlike air raid shelters used in Europe during World War II, these structures had to withstand more than blast effects. The shelters had to resist radioactive fallout. This meant that in addition to being hardened structures, they had to be constructed with materials that would block radiation. Glass blocks less than one percent of radiation while wood sheathing and brick block 34% and 50%, respectively. Eighteen inches of concrete or 25 inches of earth could block 99% of radiation.[18] The FCDA provided booklets, informational films, and traveling displays that instructed citizens on how to build and stock their shelters to survive not only the initial blast but to provide protection from fallout for approximately two weeks. Early shelter surveys of existing buildings were conducted by the FCDA in locations such as Tulsa, Oklahoma, and Charleston, West Virginia.[19] Some local civil defense groups organized volunteers to complete independent shelter surveys. The American Institute of Architects (AIA) also supported early surveys, publishing a 1951 booklet titled "Civil Defense: the Architect's Part."[20] In the booklet the AIA argued that each AIA chapter should work with their local civil defense groups to assess buildings in their areas for shelter potential.

Initial public response to civil defense was positive. FCDA publications and films suggested that participation was a patriotic duty and citizens, with World War II still fresh in their minds, accepted it as such. As nuclear anxiety entered the zeitgeist, helped through movies like Godzilla, books like *A Canticle for Leibowitz*, and comic book storylines, support for civil defense began to wane. With the development and successful testing of the hydrogen bomb by the United

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[17] David Monteyne, *Fallout Shelter: Designing For Civil Defense In the Cold War* (Minneapolis: University of Minnesota Press, 2011).

[18] Monteyne, *Fallout Shelter*, 48.

[19] Monteyne, *Fallout Shelter*, 43.

[20] Monteyne, *Fallout Shelter*, 43.

States in 1952 and the Soviet Union in 1955, the fear and doubt regarding the effectiveness of civil defense preparations grew.[21]

In 1955, in direct response to the Soviet's test of the thermonuclear bomb, the FCDA began conducting annual civil defense exercises. Called "Operation Alert" the exercises simulated a nuclear attack on cities across the nation. President Eisenhower and 15,000 federal employees participated in the first exercise by evacuating Washington D.C. and spending three days at 31 classified shelter sites. However, as Rose points out in *One Nation Underground*, the public was apathetic about the exercises and government employees did not react much better. During the first day of the drill, the Health and Education Secretary stopped off for lunch during the evacuation. A Washington civil defense official said that Operation Alert was "so inadequate it couldn't cope with a brush fire threatening a doghouse in the backyard."[22]

The hydrogen bomb tested by the United States in 1952 was 450 times more powerful than the bomb dropped on Nagasaki less than a decade before. These thermonuclear bombs extended the radius of total destruction from one mile to five miles.[23] Shelters were now impractical within an 11-mile radius. This new fact forced the FCDA to rethink their policy of sheltering in place. Plans for the evacuation of people from urban centers to suburbs and rural communities were developed by cities around the country at the FCDA's urging. Mandatory evacuations became part of the Operation Alert exercises as well; however, evacuation of a significant urban population proved to be as difficult as one would imagine.

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[21] Kenneth Rose, *One Nation Underground: The Fallout Shelter in American Culture* (New York: New New York University Press, 2001).

[22] Rose, *One Nation Underground, 28*.

[23] Monteyne, *Fallout Shelter*.

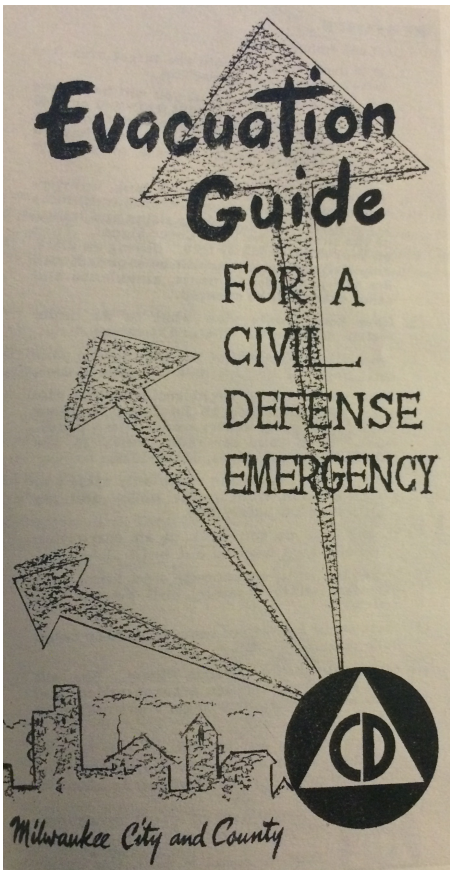

Figure 5. Milwaukee City Civil Defense Administration Evacuatuion Guide.[24]

Denver's plan required a significant portion of the population to walk out of town and assumed that at a certain point, traffic would allow for vehicle shuttling of these pedestrian evacuees.[25] Tests of the evacuation plan in Milwaukee showed that even with seven hours of warning and perfect traffic conditions, evacuation of the city was still impossible.[26]

The oscillation between shelter in place and evacuation by the nation's supposed experts in protecting the general population sent a mixed message. In a time of faltering support for civil defense, the FCDA was alternately telling people they could and could not survive a nuclear

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[24] Scheibach, "*In Case Atom Bombs Fall," 175.*

[25] Denver Office of Civil Defense, *Civil Defense Committee on Evacuation* (Denver: Office of Civil Defense, 1955).

[26] Rose, *One Nation Underground*.

attack by remaining in their homes. To combat this inconsistency, President Eisenhower took a stand by creating the National Policy on Shelters in 1958. The plan called for the identification of existing structures that could serve as fallout shelters and to further encourage the construction of private and community shelters.[27] Even with Eisenhower's support, not much came of the shelter policy.

The Kennedy Administration was also a supporter of civil defense. To replace the FCDA, Kennedy created the Office of Civil Defense Mobilization (OCDM), which was in charge of stockpiling shelter supplies and materials and helped coordinate state and local planning of civil defense programs. The Office of Civil Defense (OCD) soon replaced the OCDM. In 1961, in response to growing tensions with the Soviet Union, President Kennedy moved the OCD under the DoD. This led to a high point of funding for civil defense.[28] Though the concept of private shelters had been the subject of many civil defense filmstrips, booklets, and pamphlets, very few families had constructed a shelter for their personal use. The OCD, under guidance of the Secretary of Defense Robert McNamara, was tasked with developing a national civilian fallout shelter program. The Kennedy Administration provided increased funding for the program, and the OCD's structure within the DoD provided access to design professionals from the Army Corps of Engineers and the Navy Bureau of Yards and Docks.

The OCD developed polices and standards for the training of architects and engineers to conduct studies of public buildings in cities and towns across the nation. They coordinated contracts and cooperative programs with other federal and state agencies and produced publications, pamphlets, and other educational products to solicit the assistance from building owners and the public. The resulting NFSS consisted of three phases: first, the initial survey and research of public buildings by OCD trained architects and engineers; second, the identification of appropriate shelter spaces via a government designed computer program followed by physical

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[27] Scheiback, *"In Case Atom Bombs Fall"*.

[28] Rose, *One Nation Underground.*

inspection of interior spaces, and the mapping, marking, and stocking of public shelters; and third, the annual update of public shelter data and development of Community Shelter Plans by urban planners.

By the late 1960s, the American public was growing wary of the OCD's klaxon call to beware. Shelters were seen as cowardly, as typified in the opening verse of Bob Dylan's 1962 song "Let Me Die in My Footsteps", "I will not go down under the ground/ 'Cause somebody tells me that death's comin' 'round/ An' I will not carry myself down to die/ When I go to my grave my head will be high /Let me die in my footsteps/ Before I go down under the ground."[29] During the 1970s, relations with the Soviet Union warmed, and the signing of the Strategic Arms Limitation Treaty (SALT I) in 1973 further reduced the need for the OCD. In 1979 President Carter moved the OCD under the newly created Federal Emergency Management Agency (FEMA). Though the OCD still managed civil defense programs, it was now primarily focused on responding to natural disasters.

[29] Bob Dylan, "Let Me Die in My Footsteps," *The Bootleg Series, Vol 1-3: Rare & Unreleased 1961-1991*, (Recorded 1962. Columbia), http://www.bobdylan.com/us/music/the-bootleg-series-vol-1-3-rare-and-unreleased-1961-1991.

CHAPTER III

THE AMERICAN CITY DURING THE COLD WAR

Following World War II the United States economy grew on a scale that was unimaginable for citizens who lived during the war. The United States had escaped the massive combat deaths and physical destruction of cities seen by other combatants in Europe. There was little competition for consumer goods, and the American economy surged. Several federal programs in the late 1940s and early 1950s contributed to the massive U.S. economy but three programs in particular also had a profound impact on the evolution of modern American cities that continue to this day.

With the return of millions of American war veterans, the U.S. Congress was looking to avoid the mistakes it had made with the treatment of veterans returning from World War I as well as to retain the stable economic climate to which the soldiers were returning. The Servicemen's Readjustment Act of 1944, commonly known as the G.I. Bill of Rights, was signed by President Roosevelt in June 1944 and gave returning veterans: the opportunity to continue their training or education via a free tuition credit and a monthly allowance; guaranteed loans for the purchase or construction of homes, businesses, or farms; unemployment allowances; and job counseling.[30]

A second federal program established post-war was the Housing Act of 1949. Signed by President Truman the Act's stated goal was to provide "a decent home and suitable living environment for every American family."[31] The Act had six titles and included $1 billion for slum clearances and the redevelopment of these lands; the construction of 810,000 low-rent public housing units; technical research on housing construction; loans for construction and improvement of farms; and creation of the decennial census.

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[30] Mark Gelernter, *A History of American Architecture: Buildings in Their Cultural and Technological Context* (Hanover N.H.: University of New England Press, 1999), 262.

[31] Richard Freeman, "The 1949 Housing Act versus 'urban renewal,'" *Executive Intelligence Review* 23 No. 50 (1996): 27.

The third program – this one aimed at improving transportation - was signed in 1956. President Eisenhower's Federal-Aid Highway Act was not the first; however, it was informed not only by the highway acts that came before, but by Eisenhower's experience in Germany during World War II. Although previous acts had funded over $200 million for an interstate highway system, Eisenhower had learned from the superior mobility provided by the Germany's autobahn and was in favor of "broader ribbons across the land."[32] The Federal-Aid Highway Act of 1956 increased the highway system to 41,000 miles and allocated $25 million for its construction each year between 1957 and 1969. The second section of the act was titled, "National System of Interstate and Defense Highways," and stated that completion of the highway system was essential to national security.[33]

These three federal programs came into being as America was undergoing radical changes and intensified those changes. The population was booming, and for the first time in decades Americans were able to rely on steady jobs and a surplus of wealth. Spending on consumer goods increased. Automobiles, popular before World War II, soon became an essential status symbol as steel, rubber, and gasoline rationing ended. The population increase and return of veterans resulted in the need for new homes, schools, and shopping centers. Due to the promotion of homeownership by the federal government through loan programs, these newly constructed residences were predominantly single-family homes constructed on open land at the city's fringe. Homes constructed in the city's urban center were typically tall tower blocks with more stories on a smaller footprint. Many of these were constructed on land cleared as part of the 1949 Housing Act and were meant for low-income residents.

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[32] "Federal-Aid Highway Act of 1956: Creating the Interstate System," Federal Highway Administration, accessed December 2014, http://www.fhwa.dot.gov/publications/publicroads/96summer/p96su10.cfm.

[33] An act to amend and supplement the Federal-Aid Road Act approved July 11, 1916, to authorize appropriations for continuing the construction of highways; to amend the Internal Revenue Code of 1954 to provide additional revenue from the taxes on motor fuel, tires and trucks and buses; and for other purposes; June 29, 1956; Enrolled Acts and Resolutions of Congress, 1789-1996; General Records of the United States Government; Record Group 11; National Archives.

All of these factors: growing home ownership, increase in automobile usage, population increase, and clearance of slums for low-income housing, plus the federal laws that supported these factors, resulted in a massive decentralization of American cities in the decades following World War II. Just before the end of the war America was an urban nation with distinct edges separating cities and rural areas. The bulk of the population lived and worked in cities that had a full range of neighborhoods that supported the poorest and the most elite. While these neighborhoods were still segregated by race and class, there was intermingling between each group on public transportation, in stores, and on sidewalks. Office and retail workers, bankers, and blue-collar laborers co-existed. By the mid-1950s a majority of Americans were living and working in suburban cities and towns. The communities were still divided socio-economically and racially; however, there was now virtually no interaction as each community could provide its denizens with insulated schools, shopping areas, and residential neighborhoods.[34]

The majority of those leaving the cities were white middle-class families who were told that the suburbs offered relief from the evils of the city, that there were neighborhoods near nature with clean air and plenty of space for children to play. Large-scale tract developments offered simple and inexpensive houses with wide streets and room for automobiles. These developments required nearby schools and shopping centers. Soon, the developers promised, there would be no need to enter the city. As people fled the city's urban center, offices and other light industrial companies were moving to the edges as well. Lured by attractive land prices and a growing suburban workforce, businesses began constructing corporate campuses and office parks. These retail and office locations offered plenty of easily accessible parking in park-like landscapes.[35] Infrastructure, specifically arterial roads that would bring workers and shoppers from their neighborhoods to the concentrations of office and commercial centers, were an essential part of the development of these suburban communities.

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[34] Jon C. Teaford, *The Metropolitan Revolution: The Rise of Post-Urban America* (New York: Columbia University Press, 2006): 17-20.

[35] Gelernter, *American Architecture*, 263.

Arterial roads and the interstate were also seen as the salvation of a city's CBD. The CBD was according to Teaford in *The Metropolitan Revolution*, "the undisputed focus of downtown,"[36] home to banks, department stores, groceries, theaters, offices, and residences. As the middle-class abandoned the city for the suburbs post-war, neighborhoods began to deteriorate. Large blocks of buildings were deserted and began to decay. The steady loss of residents and businesses left the CBD in disarray. Property values dropped and exacerbated the problem. Those who remained in the city were predominately working poor and minorities who were prevented from or unable to secure financing for a single family home. The solution, for city planners across the nation, was to bring residents, shoppers, and workers to the city. To do this, blighted areas had to be cleared, parking garages and surface lots had to be built, and interstate highways needed to bring suburbanites directly into the CBD.[37]

Plans were created in New York, Dallas and Fort Worth, Denver, Chicago, Los Angeles, Boston, Seattle, and smaller cities across the country to tear down slums and construct interstate highways into the downtown. Decaying buildings would be torn down and replaced with low-income residential towers or, more often, parking lots. This process, termed Urban Renewal, displaced thousands of people living in neighborhoods considered blighted, demolished thousands of historic buildings, and bisected communities with multiple lanes of interstate. Due to bureaucratic necessities, many of the Urban Renewal projects were phased and took decades to complete, leaving vacant lots throughout cities.[38] Resistance to Urban Renewal began in the early 1960s in cities across the nation. Residents of neighborhoods in conjunction with planners, minority leaders, and community organizers began taking a stand against what they felt was unwarranted and ill advised eminent domain takings. Race riots, often unrelated to Urban

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[36] Teaford, *The Metropolitan Revolution*, 2.

[37] Gelernter, *American Architecture*, 265; Teaford, *The Metropolitan Revolution*, 40-60.

[38] Teaford, *The Metropolitan Revolution*, 112.

Renewal and slum clearing, took place in the late 1960s in Detroit, Los Angeles, New York, and St. Louis.[39] This further reinforced the notion of a decaying urban core.

It is within this urban context that the NFSS began its examination of existing buildings. It would soon become clear that while those who sought safety had abandoned the city, it would be necessary to return to the city for protection from a nuclear attack.

[39] Teaford, *The Metropolitan Revolution*, 134.

CHAPTER IV

NATIONAL FALLOUT SHELTER SURVEY PROGRAM HISTORY

In a September 1961 *Life* magazine article President Kennedy announced a program to survey all public buildings for fallout shelter space. Portions of these buildings would then become public shelters, with the new goal of providing fallout protection for every American.[40] This was the humble beginning of the NFSS program. Initiated by the Kennedy Administration at a time when fear of nuclear attack was high and the policy of private sheltering had proven unfeasible, the program was designed to locate fallout shelter space in existing building stock, mark the shelters and provide two week's worth of food, water, and other supplies for each location identified. The same year that the announcement was made, the OCD was put in charge of developing a process for implementing the NFSS program in cities and towns across the nation. The OCD worked with the Army Corps of Engineers and Navy's Bureau of Yard and Docks to develop these methods.

The first step was to determine the minimum requirements for public fallout shelters. This was done by analyzing the two types of protection from radioactive fallout: geometric shielding and barrier shielding. Barrier shielding referred to the mass of a structure, while geometric shielding referred to the distance from an outside wall.

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[40] John Kennedy, "A Message to You From the President," *Life*, September 16, 1961, 95.

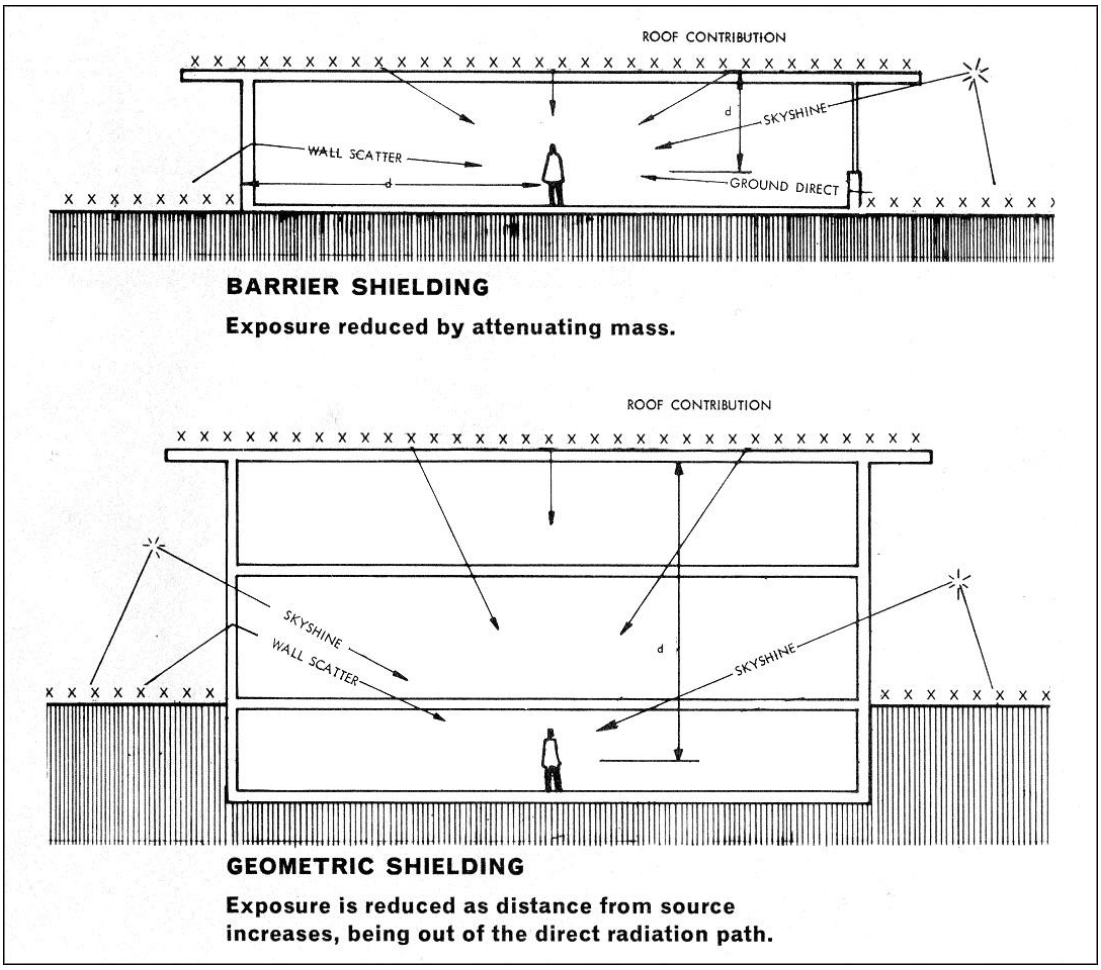

Figure 6. Diagrams of Barrier and Geometric Shielding.[41]

Based on the shielding, a Protection Factor (PF) was calculated for each potential shelter. This was a mathematical expression of the amount of radiation a person would receive within a particular space.[42] A PF of 100 denoted that a person inside the shelter would receive 1/100 of the radiation dose of a person outside the shelter. Dr. Edward Teller, a physicist who helped develop the hydrogen bomb, believed that contamination would be at critical levels for 14

[41] American Institute of Architects, "Design for Survival: Architects' Involvement in Security Design Dates to Early Cold War Years," accessed December 2014, http://www.aia.org/akr/Resources/Documents/AIAP037354.

[42] Monteyne, *Fallout Shelter*.

days following a nuclear attack and that sheltering would be necessary during this time.[43] Teller's estimates were accepted by the OCD and so, in addition to providing an appropriate PF, public shelters needed to be stocked with a two week's supply of food and water as well as radiation detection equipment, sanitation supplies, and first aid supplies. Spaces that met these criteria would then be marked as public shelters and would become part of a community's civil defense plan. The OCD set lofty goals for completion of the NFSS, expecting survey and marking of shelters to be completed by 31 December 1962.[44] To meet this deadline the Program was broken into three phases. Phase 1 included the inventory of day and night populations; surveying population centers to identify the location of potential fallout shelters; and collecting shielding data for computation of PFs for each shelter. Phase 2 included marking and stocking shelters that met OCD requirements; determining the cost and feasibility to improve those shelters that did not meet requirements; and the creation of shelter use plans[45] by local civil defense agencies. Phase 3 was an annual update of shelter locations and updates to the shelter use plans.[46]

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[43] Office of the Chief of Engineers, *Fallout Shelter Survey Instructions* (Washington D.C.: U.S. Government Printing Office, November 1961): Annex C-2.

[44] Office of the Chief of Engineers, *Fallout Shelter Survey Instructions*, 1.

[45] DoD OCD, *Functions and Responsibilities of Building Owners, Local Governments, State Governments in the National Fallout Shelter Program* (Washington D.C.: U.S. Government Printing Office, 1962).

[46] Office of the Chief of Engineers, *Fallout Shelter Survey Instructions*, 17.

Figure 7. Fallout Shelter Stocking, January 1963.[47]

The federal government believed that its role in development of public shelters lay in the contracting of survey work that would be conducted by local architect-engineer firms, the training of supervisory personnel from selected firms who would complete the survey work, the mechanical computation of PFs based on forms produced by survey teams, the production of fallout shelter signs, and the allocation of shelter supplies to local governments for distribution to specific shelters. Collecting data for analysis was to be conducted by local firms recommended to OCD Contracting Officers. Once data was processed by the Bureau of the Census and the National Bureau of Standards, local civil defense agencies were sent addresses of appropriate shelters that they then used to develop their own shelter use plans. The OCD regional director would coordinate allocation of shelter signs and supplies; again the local civil defense agencies

[47] "Fallout Shelter Stocking, 01/22/1963," Fallout Shelters/Civil Defense 5/5/60 - 1/22/63, 05/05/1960 - 01/22/1963; Construction Project Photographs, 1927 – 1981, Records of the Office of the Chief of Engineers, 1789 – 1999, National Archives.

would mark and stock the shelters and perform annual checks to update shelter locations and shelter use plans.

Phase 1

The OCD's goal for Phase 1 of the shelter survey program was to: gather enough data to make a determination on which buildings could be used as public shelters; select an appropriate PF for each geographical area, referred to as a Standard Location; and for local governments to begin developing shelter use plans. The first step was to contract architect-engineering firms to complete the surveys of existing buildings. Architects and engineers were selected because the survey required "a knowledge of construction, a talent for organizing space, and an understanding of the techniques of protection."[48] Before contracts were awarded, firms had to participate in a two-week training provided by the U.S. Army Corps of Engineers or the Navy's Bureau of Yard and Docks.[49] The training was held at the Army Engineering School in Fort Belvoir, Virginia; the Naval Civil Engineering Corps Offices in Port Hueneme, California; and at various civilian universities.[50] Upon certification of successfully completing the training course, firms would be issued contracts to begin the survey. The contracts were completed in accordance with DoD directives, and regional OCD officials negotiated costs.[51] The number of architect-engineering firms assigned to complete a survey in a city, town, or group of communities varied with the size of the area. However, OCD regulations required firms to be local if possible, for work to be spread out to different firms so as to not overload any one firm, and to discourage expansion of firms for the sole purpose of taking on survey work in larger areas.[52] The AIA was a

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[48] Monteyne, *Fallout Shelter*, 44.

[49] Office of the Chief of Engineers, *Fallout Shelter Survey Instructions*, 11.

[50] The two-week training sessions were offered at the University of Denver, the University of Colorado Boulder and other colleges along the Front Range.

[51] Office of the Chief of Engineers, *Fallout Shelter Survey Instructions*, 35.

[52] Office of the Chief of Engineers, *Fallout Shelter Survey Instructions*, 37.

keen supporter of the program and encouraged firms to participate; however, many members rejected the idea of fallout shelters, suggesting that architects were helping to build caves that the public would crawl into at the first sign of trouble.

Once a contractor was selected they would begin by gathering data on the area to be surveyed. This data might include: Sanborn maps, population estimates that would reflect day and night population, and any previous survey information. Once this was done contractors would send out field personnel who would visit every building, aside from single family residences, and record addresses and owner/operator information, wall and ceiling thicknesses, construction material type, surroundings of buildings, and the angles of corners. Surveyors were taught to estimate the PF for each building and fill out forms for those which had a PF of 20 or more and the potential to shelter 50 or more people.[53] Mines, tunnels, subways, caves, and underground parking garages were also surveyed. Surveyors completed punch card FOSDIC (Film Optical Sensing Device for Input Into Computers) forms. Once a location was surveyed, these forms were sent off to the Bureau of the Census in Jefferson, Indiana, where approximately a week later they were converted to magnetic tape. The tape was then transferred to the National Bureau of Standards in Washington D.C where an automatic processing system computed the PF and an estimated capacity of each shelter.[54] This process took approximately one month. Lists of potential shelter spaces including their addresses, PF, and estimated capacity would be sent to local civil defense offices who could then move on to Phase 2 of the survey.[55]

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[53] Office of the Chief of Engineers. *Fallout Shelter Survey Instructions*, 21.

[54] Office of the Chief of Engineers, *Fallout Shelter Survey Instructions* (Washington D.C.: U.S. Government Printing Office, November 1961): Annex B-1 Revised 15 March 1962, 2.

[55] At the same time civilian buildings and structures were being surveyed, military installations were also being examined for shelter capability. It was made clear that the funding for the survey would be the responsibility of each installation. If the facility wished, it could hire contractors to do the work or train its own staff to do complete the survey. If the installation had sensitive buildings or structures, it could manually process the PF and capacity of any shelter space. The OCD emphasized that the shelters were to be used for military personnel and were not to be included in shelter use plans for the civilian population.

Phase 2

During Phase 2 surveyors would visit the prospective public fallout shelters provided by local civil defense offices and confirm that the building was habitable. They would evaluate ventilation, auxiliary power (power or auxiliary power was required to operate ventilation and lighting), and storage space for shelter supplies, and determine if the computer determined capacity and PF were accurate. In areas where there was a deficit of shelters, local civil defense offices would receive lists of buildings that, with improvements, might be used as shelters. Surveyors would visit these buildings and evaluate the orientation of doors and windows, ventilation, and recommend alterations and estimate the cost of modifications.[56] Data verifying this was collected on Phase 2 FOSDIC forms that would be sent to the OCD for analysis of shelters at the national level.[57] This analysis was used for war game planning and to evaluate the country's readiness.

Once surveyors verified that the space was usable as a public shelter, local officials would begin the process of contacting building owners to secure Fallout Shelter Licenses. These forms required a signature of the owner and an explanation of the owner's responsibilities and liabilities, and were required before marking or stocking of the shelter was allowed. The license allowed for the marking of the shelter both inside and out; storage of shelter supplies (water, food, medical supplies, radiological equipment, and sanitation supplies) either within the shelter or immediately adjacent to it[58]; permission for entrance by local civil defense officials to maintain and assess the shelter supplies and equipment; and permission to allow the public to enter the building for use as a shelter during and after an actual or impending attack.[59] The license did not

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[56] Monteyne, *Fallout Shelter*, 50-51.

[57] Office of the Chief of Engineers. *Fallout Shelter Survey Instructions Phase 2* (Washington D.C.: U.S. Government Printing Office, March 1962): 4.

[58] These supplies took up an estimated 1 1/4 cubic feet for each person sheltered.

[59] DoD OCD. *Functions and Responsibilities.*

apply to tests or exercises and though it was "binding upon his heirs, assigns, or successors in interest," it could be canceled by the owner for any reason with 90 days notice.[60] Many states went further and immunized property owners from liability when signing shelter licenses, and Colorado and Washington made the state liable to license holders for "injury or damage resulting from acts carried out under" civil defense laws.[61]

When license forms were obtained, local civil defense offices could begin finalizing shelter use plans and could start the marking and stocking process. Standard fallout shelter signs were developed and approved by the OCD; no others were to be used. The signs were furnished by the DoD and sent to local governments for posting. Two were designed, one measuring 10 x 14 inches for interiors and the other measuring 14 x 20 inches for exteriors. They were metal with reflective yellow and black paint. In addition to these, additional signs were often necessary to direct the public from the street to the shelter.[62]

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[60] DoD OCD. *Functions and Responsibilities,* 1.

[61] DoD OCD, *Functions and Responsibilities,* 4. Twenty-seven states did not immunize property owners from liability and did not make the state liable for injury or damage. If cities did not have local protection for property owners, this might have made building owners wary about agreeing to house a public shelter space.

[62] Office of the Chief of Engineers, *Fallout Shelter Survey Instructions,* 33-34.

Figure 8. Extant Fallout Shelter Sign in Dickenson, North Dakota. Note directional arrows and capacity.[63]

Once a shelter was properly marked, local officials were responsible for making sure the shelter was stocked with the appropriate amount of supplies. The DoD and regional OCD offices coordinated with local civil defense groups to provide the shelter supplies. Once the supplies left the federal warehouses, the OCD believed that their role in the shelter survey was done. Local governments were responsible for locating warehouse space for storage of the supplies and planning the shipment to specific shelters in the area. The stocking of shelters was often not finished until long after a space had been designated as public shelter, often because the amount of space needed for the supplies was underestimated and the task of loading and unloading up to 2,000 pounds of supplies for a 50-person shelter was taxing on local government's time and money.[64]

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[63] Kathryn Plimpton, August 2013.

[64] Monteyne, *Fallout Shelter*, 56.

Shelter Use Plans

Nascent shelter use plans were to be developed by local civil defense offices after the completion of FOSDIC forms at the end of Phase 1 with more detailed plans developed later. The OCD believed that local officials, using maps of day and night populations and lists of potential shelters, could determine where best to place public shelters in the community. This would allow only those shelters that best served the interests of the public to be marked and stocked. Furthermore, it would allow local officials to identify population areas that had a dearth of shelters and make recommendations on improving any potential shelter spaces early in Phase 2 of the survey. The creation of the plans was necessary for assuring that the entire population of a city or county knew the location of their nearest public fallout shelters[65]; however, the OCD suggested that the marking of spaces should be completed even if shelter use plans were not yet completed. The OCD, at the regional and federal level, did not foresee having a hand in the creation of shelter use plans. In a 1962 fact sheet the OCD stated that, "the Office of Civil Defense is preparing guidance for use in writing such plans, but local subdivisions are urged to proceed on their own initiative to develop plans for the use of each structure which the locality intends to use as a shelter when it is marked and stocked."[66]

Most communities did not have the personnel necessary to complete complex shelter use plans. Many cities, towns, and counties focused not on day and night population locations when selecting spaces for use as public shelters, but rather total population of the community, assuring that there were spaces for the entire population but with no regard as to where the populations were concentrated. The reason for this, in part, was that the lack of buildings that had adequate shelter spaces meant that no location could be rejected outright. A second factor was that because the OCD was not responsible for development of the plans, there was less emphasis in official documents on the creation of them and no monitoring of their progress.

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[65] Office of the Chief of Engineers. *Fallout Shelter Survey Instructions*, 30.

[66] DoD OCD, *Functions and Responsibilities*.

Community Shelter Plans

The decision to allow local governments to develop shelter use plans with little guidance from the OCD proved shortsighted. So much so, that by 1966 the OCD developed a new program whose goal was to provide the public with details on shelter locations, maps and routes to these spaces, and guidelines on what to do if there was no shelter nearby. The Community Shelter Planning Program was, according to the1966 OCD filmstrip *Community Shelter Planning*, a "thoroughly tested, completely developed program" that addressed how to move the public to shelters in times of emergency.[67] This six-step plan began by the training of planning professionals in community shelter planning strategies. The planner would use data from population surveys and current distribution of shelters to set guidelines on allocation of people to shelters. Local governments, using land use maps, would determine the amount of time needed to move to a shelter and the best mode of transportation for a given area. With this information the local civil defense offices would create individual information maps that would be distributed to each household in a city, town, community, or county. The map would include instructions on where to go in case of an attack as well as information on creating an improvised shelter in the event the household was not located near a shelter. The population surveys, training courses, labor, and production of the maps were entirely funded by the OCD.[68] Community Shelter Plans were produced and printed in newspapers and in some cases mailed to homes, with the suggestion to, "READ...AND KEEP THIS OFFICIAL PUBLICATION…IT COULD SAVE YOUR LIFE!"[69] Many plans included a space for the public to note the location of shelters near their homes, school, work, and shopping centers.

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[67] Office of Civil Defense, "Community Shelter Planning," accessed May 2014, http://www.youtube.com/watch?v=FwXE568WnXg.

[68] Monteyne, *Fallout Shelter*, 79.

[69] Monteyne, *Fallout Shelter,* 89.

Unlike other civil defense films of the 1950s and early 1960s, *Community Shelter Planning* is almost defeatist in tone, acknowledging that suburban shopping centers have "slab foundation so there's nothing below ground. Hollow wall construction so there's no density to speak of. Protection close to zero."[70] The characters discuss the same problems with schools in many communities, walls of windows and no baffles to slow down the movement of radioactive fallout. One planning official goes on to say that, "If we're lucky, if we can keep the traffic moving, you might make it in time. In time, to improvise something."[71] The film concludes with the characters discussing the best solution: designing new construction with fallout shelter space in mind and establishing ordinances that require the construction of shelters in public buildings, including schools.

[70] Office of Civil Defense, "Community Shelter Planning."

[71] Office of Civil Defense, "Community Shelter Planning."

CHAPTER V

DENVER NATIONAL FALLOUT SHELTER SURVEY PROGRAM HISTORY

True civil defense programs began in the 1950s and focused on educating people on the effects of atomic blasts, promoting the participation in civil defense exercises, encouraging the construction of private bomb shelters, and training volunteers for search and rescue, first aid, and for participation in groups like Civil Air Patrol. Denver's Office of Civil Defense, established in 1951 was no different.[72] It was not until the late 1950s that the Denver civil defense office began to properly organize itself as an agency within the City and County. This was due in part to the Eisenhower administration's development of a National Plan for Civil Defense that stated that while the federal government would be responsible with overall direction of a civil defense program, the responsibility for implementation would be vested with the states. It also, for the first time, allowed for federal funding to pay civil defense costs at the state level.[73] Eisenhower also issued a National Policy on Shelters that called for the education of the public on the risks of radioactive fallout, an initial pilot survey of public buildings that might be suitable for fallout shelters, research into how to incorporate shelters into existing buildings, the construction of fallout shelters in new federal buildings, and the construction of prototype shelters in several locations throughout the country.[74] Denver hoped to place one of the prototype shelters in its City and County building and developed a proposal for the signature of Mayor Richard Batterton who passed along the proposal in April 1960.[75] Denver was not selected.

By the establishment of the NFSS program in the early 1960s, Denver had an active civil defense advisory committee and a qualified and motivated civil defense director; the city was

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[72] Denver Civil Defense. *Basic Principals of Civil Defense* (Denver: City and County of Denver, May 1952): 17.

[73] Federal Civil Defense Administration, *Annual Report of the Federal Civil Defense Administration for Fiscal Year 1958* (Washington D.C.: U.S Government Printing Office, 1958): 2.

[74] Federal Civil Defense Administration, *Annual Report*, 9.

[75] Denver Public Library, "Prototype Community Shelter," Richard Y. Batterton Papers, WH734, Western History Collection.

busy constructing an emergency operations center (EOC) in the basement of the City and County Building and was in the early stages of developing a comprehensive civil defense plan for the city. Denver was also home to the OCD Region 6 Headquarters and the proximity of high-level OCD officials likely facilitated the development of Denver's robust program. In early 1961 five Denver architect-engineer firms had been contracted to begin Phase 1 of the fallout shelter survey: Ib Falk Jorgensen; Ken R. White; Ketchum and Konke; Rae, Peterson, and Stewart; and Musick and Musick.[76] By August 1963, 502 shelters had been located by the surveyors, providing space for more than 471,000 residents.[77] However, the number of shelters licensed for use was less than half. There is no indication that Denver began working on shelter use plans at this time. Correspondence between the mayor's office and the civil defense office seems to have focused on providing shelter space for the current population of the city and county, which in 1960 was just under 500,000.[78] There was no consideration of day and nighttime populations in these discussions.

In the midst of the Cuban Missile Crisis, the Denver Office of Civil Defense began fielding calls from the public regarding possible civil defense measures that could be undertaken if an attack was imminent. In response to the overwhelming number of calls the office released, through the *Denver Post*, a list of 116 fallout shelters that had been located as part of the NFSS. Of these shelters, only 13 had been stocked with supplies. The largest shelter was located in the Denver City and County building, which had supplies for 2,732 people. The smallest could shelter only 80. Of the 13 shelters, all but one was located in the Denver central business district; the South Branch of the YMCA at Yale Avenue and Colorado Boulevard was the exception.[79] Four

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[76] Denver Public Library, "Press Release, January 22, 1962," Richard Y. Batterton Papers, WH734, Western History Collection.

[77] Denver Public Library, "Inter-Office Correspondence August 19, 1963," Thomas Currigan Papers, WH929, Western History Collection.

[78] U.S. Census Bureau, "Population of Counties by Decennial Census, Colorado," last modified March 1995, http://www.census.gov/population/cencounts/co190090.txt.

[79] Ken Pearce, "Denver CD Locates 116 Fallout Shelters," *The Denver Post*, 24 October 1962, 64.

days later, on 28 October 1962, Jefferson County released a list of 17 licensed fallout shelters; however, none of these had been marked or stocked with supplies. [80]

Beginning in 1963 Denver began preparing "Civil Defense Basic Plans" for the city and county. These plans focused on imagined thermonuclear attacks in or near Denver with the assumption that the plan would be more than adequate for a disaster of lesser proportions. The 1963 plan gave detailed descriptions of the types of sirens and warnings that might be heard before an attack. The plan then skipped to the emergence of survivors from their fallout shelters, the continuity of city government, the restoration of municipal services, and how aid would be given to those injured during or after the attack.[81] Nowhere in the plan was there a discussion of how the public would locate the nearest shelter or what to do if shelters were full or if there was no shelter nearby. There were no maps of shelters or discussions regarding the number of people who might be found without protection. Instead, there were only stark acknowledgements that those without shelter would have to be evacuated and that such task was likely impossible; that shelters were nearly nonexistent outside of the Denver metro area; that there were locations in the city where adequate shelters were lacking; and that with proper foresight existing shelters could be expanded and new ones constructed.[82] No further details were provided. This plan does not appear to have been made available to the public.

In 1964 Denver began working on another plan, titled *A Disaster Plan for You*.[83] This document included information on what to do during earthquakes,[84] tornadoes, a nuclear attack,

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[80] "Jefferson Lists CD Shelters," *The Denver Post*, 28 October 1962, 25A.

[81] Denver Public Library, "Civil Defense Basic Plan, January 28, 1963," Thomas Currigan Papers, WH929, Western History Collection.

[82] Denver Public Library, "Civil Defense Basic Plan, January 28, 1963."

[83] Denver Public Library, *A Disaster Plan for You 1964*, Thomas Currigan Papers, WH929, Western History Collection.

[84] This advice was likely in response to both the Anchorage earthquake in March 1964 and a series of earthquakes experienced in the Denver metropolitan region beginning in 1962 and continuing until 1967. More than 1,300 earthquakes occurred in the metro area with the largest registering 5.3 on the Richter scale. It wasn't until 1966 that an explanation for the sudden tremors was provided: the U.S. Army at the Rocky Mountain Arsenal northeast of Denver had been injecting waste fluid into a 3,000 foot well. The fluid

or other disaster. The plan for what to do in a natural disaster was brief with most of the information addressing what to do during a nuclear attack. Standard civil defense practices were referenced: prepare for an attack by constructing a shelter and stocking it with supplies; learn the disaster plan at your child's school; establish a rendezvous point in case an attack is imminent and your family is separated; and go to a public fallout shelter if you have not constructed one in your own home. The final page of the plan included a letter from the Denver Director of Civil Defense, Retired Colonel William Allen Jr. In the letter, Col. Allen stated that although public fallout shelters have been identified in existing buildings, there were not yet enough to shelter all of Denver's population. He went on to say that, "A list of all available Public Fallout Shelters will be available as soon as the program is completed, or whenever it appears that an attack is possible."[85] Though at this time Denver had located shelter space for more than 900,000 residents, it had licensed only 334 public shelters—enough space for 466,000 people. These 334 shelters were marked but were only partially stocked with supplies necessary to survive a nuclear attack.[86] While these statistics are impressive, the fact that the public had not yet been notified as to the location of these shelters is disconcerting. Except for the 1962 article detailing the location of 116 shelters during the Cuban Missile Crisis, there had been no other dissemination of shelter location data. Even more perplexing is that this 1964 plan does not appear to have been released to the public.

Denver and the metropolitan area completed their first step in Community Shelter Planning by submitting the Inter-County Regional Planning Commission's (ICRP) "Community

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effectively lubricated existing faults, resulting in a swarm of earthquakes that continued up to a year after injections at the Arsenal had stopped. USGS, "Colorado: Earthquake History," accessed August 2014, http://earthquake.usgs.gov/earthquakes/states/colorado/history.php; J.H. Healy and W.W. Rubey, D.T. Griggs, C.B. Raleigh, "The Denver Earthquakes" *Science* 161, No. 3848 (September 27, 1968).

[85] Denver Public Library, *Disaster Plan*, 8.

[86] Denver Public Library, "Shelter Program, 10 November 1965," Thomas Currigan WH929, Western History Collection.

Shelter Plan for the Denver Region" to the Stanford Research Institute (SRI) in January 1965.[87] The SRI was asked by the OCD to create a preliminary report on the feasibility of community shelter planning. All 50 state capitals participated. SRI wanted the Community Shelter Plans to be informed by contemporary urban planning theories and, with the help of the OCD, required that plans were to be developed in conjunction with city, county, or state planners. In locations where these positions did not exist, the Army Corps of Engineers would determine which local government would complete the Community Shelter Plans.[88]

Denver's pilot study included the city and county of Denver as well as urban areas in surrounding Adams, Arapahoe, and Jefferson counties. The purpose was to identify both current and future shelter deficient areas and create recommendations that would alleviate this deficit. The Community Shelter Plans included current (1964) shelter plans as well as future shelter plans based on the 1970 population estimate and a one-mile/30-minute walking limit, meaning that for a shelter to be available to a segment of the population, it had to be within a one-mile walking distance. The Denver metropolitan area was divided into 14 planning areas, each with its own shelter drainage area.[89] A shelter drainage area, similar to a hydrological drainage area, was determined by the capacity of the shelter, the estimated travel distance, the location of physical barriers, and other topographical features.[90] In each area the peak 24-hour population was given, as was the number of people with access to shelters, the number of people without shelter access, and the amount of surplus shelter space. For each planning area the cost of ventilation improvements to potential shelters that were not deemed eligible was also provided.[91]

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[87] Inter-County Regional Planning Commission (ICRP), "Community Shelter Planning, Denver Region, January 22, 1965," Western History Collection, Denver Public Library.

[88] Monteyne, *Fallout Shelter*, 82.

[89] ICRP, "Community Shelter Planning," 3-4.

[90] Monteyne, *Fallout Shelter*, 85.

[91] ICRP, "Community Shelter Planning," 28.

Given the history of the NFSS program, a summary of the data from the Denver metropolitan region shows unsurprising results. Of the region's 1,228,366 citizens, 689,146 would be found without fallout shelter protection in 1964; however, the statistics also show that, at the same time, Denver had more than 300,000 surplus shelter spaces. How could this be possible? This means that while there were unfilled fallout shelters in the region, they were inaccessible to more than 680,000 people.[92] They might be located beyond a ribbon of I-25, on the opposite side of the South Platte River, or as was typical in large cities, in an urban core inaccessible to those living in the shelter deficient suburbs. The problem this creates can be seen in Planning Area A, the section that encompasses Denver's CBD, and Planning Area L, the section that includes the suburb of Arvada. Area A had 298,564 extra shelter spaces in 1964 while Area L had 58,711 people without access to a shelter. [93] What is more disappointing are the estimated results of the 1970 shelter plan. The same pattern holds true, the Denver Region has an unsheltered population of 767,458 with approximately 356,766 surplus shelter spaces.[94]

ICRP made recommendations to SRI on how to address these issues: conducting a second NFSS survey of existing structures in shelter deficient areas with no limitations on building size; updating regional OCD offices of new construction so that inclusion of shelter space could be lobbied for; developing a program to encourage citizens to build home basement shelters; and investigating new construction methods that might decrease infiltration of fallout into buildings.[95] As with previous disaster and shelter plans, this Community Shelter Plan was not released to the public.

Over and over again, records indicate that Denver was establishing an efficient and well-regarded civil defense program, and yet the public—the very people the city and county was

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[92] ICRP, "Community Shelter Planning," 26.

[93] ICRP, "Community Shelter Planning," A-2, A-13.

[94] ICRP, "Community Shelter Planning," 26.

[95] ICRP, "Community Shelter Planning," 29.

intent on protecting from nuclear attack— was not a part of the planning process. Denver civil defense officials, as well as state and federal officials, made the assumption that the public was paying rapt attention to the national shelter program.

Denver's civil defense plan had a real world test on 16 June 1965. Floodwaters roared along the South Platte River, damaging or destroying over 1,000 homes, sweeping away 16 bridges, and killing more than 20 people.[96] Denver officials attributed the low death toll directly to the creation of civil defense plans for the city and to OCD exercises simulating nuclear attacks. In press releases and OCD newsletters Mayor Tom Currigan and Civil Defense Director Col. Allen credited the establishment of the EOC and generation of standard operating procedures for limiting the amount of chaos during the flood and for the quick response by emergency, utility, and healthcare professionals immediately afterwards.[97] Though they acknowledged that there were some missteps, the city was determined to rectify these in the 1966 Disaster Plan, created less than a year after the flood. Unlike earlier plans, the 1966 document focuses heavily on natural disasters and the processes for communication during emergencies—a failing that was identified during the 1965 flood.

Following the acceptance of the Community Shelter Plan by SRI—the biggest complaint of which was that Denver did not provide a map that showed the location of the identified shelters—and the overall successful civil defense reaction to the 1965 flood, Denver's Civil Defense and the OCD's Region VI office in Denver nominated Mayor Tom Currigan and the Denver Office of Civil Defense for an outstanding achievement award.[98] In the summer of 1968 Denver received the National Office of Civil Defense Distinguished Service Citation for its early successes as well as for its progress in marking and stocking shelters. By this year Denver had

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[96] Denver Post, "1965 South Platte Floods," accessed August 2014, http://blogs.denverpost.com/library/2013/06/14/1965-south-platte-river-floods/8735/.

[97] Denver Public Library, "Press Release, July 14, 1966," Thomas Currigan Papers, WH929, Western History Collection.

[98] Denver Public Library, "Memo from Col. W.M. Allen Jr., Director of Civil Defense, 21 May 1968," Thomas Currigan Papers, WH929, Western History Collection.

stocked shelters for more than 100% of its total population; however, it was not mentioned that the city still had over 300,000 people who did not have access to these shelters. They either lay outside of their shelter drainage area or would be unable to access a shelter due to physical barriers. In addition, the location of these shelters had never been explicitly disclosed to the public. They were marked with the official signs but it was clearly upon residents to locate and remember the nearest fallout shelter.

In a July 1968 letter to the Mayor's office, a Denver resident remarked that "it would be nice also if the citizens of Denver knew where these fallout shelters were. To my knowledge neither myself or any of the people I know, including members of my family, know where a single fallout shelter is in our neighborhoods."[99] In response to this letter the Denver Office of Civil Defense noted that, "We too think, and have so thought for some time, that it would be helpful to the public to publish a list of the 887 buildings in Denver that can provide shelter for 1,033,597 people."[100] As much as the Mayor's Office and the Denver Office of Civil Defense argued that they were well prepared for a nuclear attack, it was not until 1971 that the first Community Shelter Plan maps were produced for the public at large.

While the Denver metropolitan area finalized its Community Shelter Plan for publication, the OCD began a new shelter survey program: the Home Fallout Protection Survey. By 1966 shelter spaces for 155 million citizens had been located across the nation; however, the OCD officials knew that these shelters were located in urban centers and that the majority of Americans were living in suburbs outside these areas. A new effort to survey small structures[101] for potential fallout shelters added an additional two million spaces but, again, these were

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[99] Denver Public Library, "Letter from Charles D Strong to Mayor Thomas Currigan, 10 July 1968," Thomas Currigan Papers, WH929, Western History Collection.

[100] Denver Public Library, "Letter from Mayor Thomas Currigan's Office to Charles D. Strong, 17 July 1968," Thomas Currigan Papers, WH929, Western History Collection.

[101] The NFSS included structures that could hold 50 people or more. The small structures survey included buildings that could house 10–40 people.

predominately located in central business districts and downtowns.[102] To address the millions of Americans who would be left without access to a public shelter in the event of an attack the OCD, with the assistance of the U.S. Bureau of Census, began the Home Fallout Protection Survey (HFPS). This survey was designed to find homes with basements and advise the owners on how to upgrade their space for protection against fallout. A 12-question document was mailed or hand-delivered to homes by the U.S. Bureau of Census. The answers were then processed and approximate PF numbers were provided for each basement, highlighting the safest corner. A packet with this information and tips on how to increase the PF was then returned to the homeowners.[103]

Colorado was one of the first nine states to participate in the HFPS: 349 homes were mailed questionnaires, an additional 183 homes had them hand-delivered, and 77% of the questionnaires were mailed back. From these, only 34 spaces had a PF of 40, the standard number required of public community shelters by the OCD. An additional 779 spaces were located with a PF of 20–39, though the OCD pointed out that these spaces could be brought to a PF 40 level with little effort.[104] Critics of the HFPS pointed out that the survey was useless for those living in the southern United States where basements are not common, and that because the OCD did not follow up with homeowners on the status of PF upgrades, the survey was practically without value. Certainly in Colorado, the addition of space for fewer than 800 people would do little to address the over 300,000 residents who did not have access to a public shelter. For these people, and for those living in areas with no basements, salvation lay in the creation of rational and cogent Community Shelter Plans.

The Denver metropolitan area's Community Shelter Plan was included as a supplement to the 10 March 1971 issue of the *Denver Post*. Copies could also be mailed to homeowners who

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[102] Sperry, "Fallout Shelter Survey," 894.

[103] Office of Civil Defense, *1969 Annual Report of the Office of Civil Defense*, (Washington D.C.: U.S. Government Printing Office, 1969), 21.

[104] Office of Civil Defense, *1969 Annual Report*, 22.

called the Denver Office of Civil Defense office. The plan included the city and county of Denver, as well as Adams, Arapahoe, and Jefferson counties. In addition to maps and addresses of marked and stocked public shelters, the plan included a step-by-step guide on what to do when warning sirens sound; what to take with you to a public shelter; the importance of protection from radioactive fallout; what to do if you live on a farm; how to make an improvised shelter in case there is no time or access to a public shelter; general guidelines on what to do during natural disasters including floods, earthquakes, tornadoes, high wind, and winter storms; and a place for each member of the household to note which public shelter is closest to their home, work, school, or shopping center.[105]

Figure 9. Denver Metropolitan Area Community Shelter Plan.[106]

[105] Civil Defense and Disaster, "Community Shelter Plan," *Denver Post*, March 10, 1971, Supplement, 1-25.

[106] Civil Defense and Disaster, "Community Shelter Plan," 1.

To locate the nearest shelter you find your location on the reference map, turn to the correct page, and locate the shelter nearest to your home, office, or school. The instructions indicated that you should take note of your daytime and nighttime locations. Most shelters were to be accessed by foot; however, in some places there were designated parking areas that would bring you close to a shelter or group of shelters where you could leave your vehicle and then proceed on foot. The addresses and building names were listed but the capacity of each shelter was not provided. The instructions stated that if you arrive at a full shelter you will be directed to an available space nearby. Each area was broken into colored shelter drainage areas: pink, blue, green, yellow, and dark grey. Once you located your home or office, the public shelters that were available to you would be all those located on the same map. If you found that you were in an area with no colored map, you were instructed to go to the best protected corner of the basement and read the advice regarding constructing an improvised shelter.

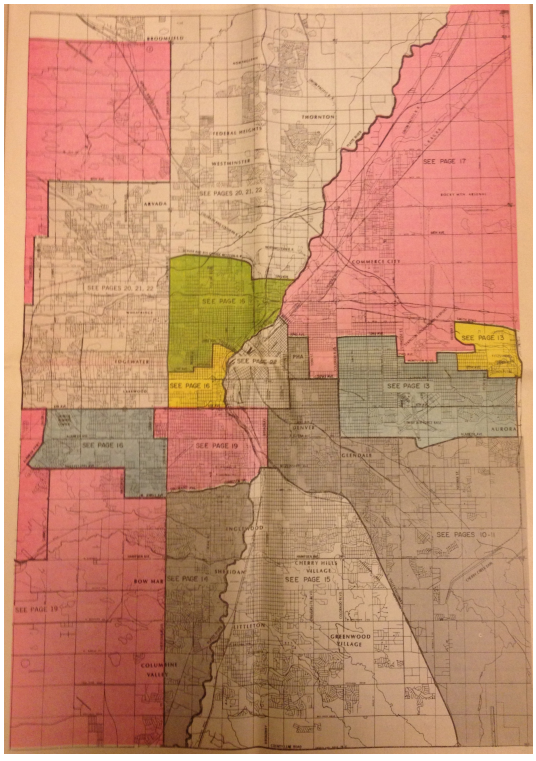

Figure 10. Denver Metropolitan Area Community Shelter Plan, reference map.[107]

[107] Civil Defense and Disaster, “Community Shelter Plan,” 9.

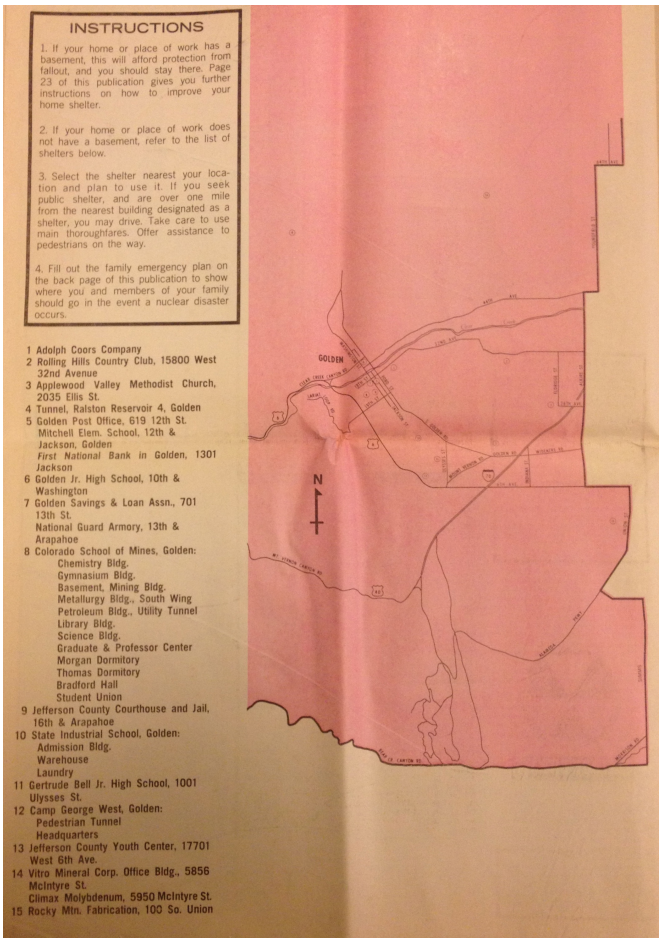

Figure 11. Denver Metropolitan Area Community Shelter Plan, Golden map.[108]

As expected, central businesses districts had the highest concentration of public shelters; however, even these were scarce in small cities throughout the metropolitan area. Golden, which had over 9,000 residents in 1970, had a total of 15 public shelters in its drainage area. In more recently established neighborhoods, there were even fewer available shelters. In Arapahoe County, in a 26.8 square mile area bounded on the west and east by I-25 and Parker Road and on the north and south by the Cherry Creek Dam and Lincoln Avenue, there were six public shelters.[109] Meanwhile, in downtown Denver there were 202 shelters covering 10.2 square miles.

[108] Civil Defense and Disaster, “Community Shelter Plan,” 12.

[109] Civil Defense and Disaster, “Community Shelter Plan,” 11.

Denver was not alone in the delayed production of their Community Shelter Plan. In fact, a majority of plans across the country were not produced until the beginning of 1970, including those in Dallas (1970), Suffolk County in New York (late 1969), Franklin County in Ohio (late 1969), and Spokane (1969).[110] Though some locations updated their Community Shelter Plans through the 1970s and 1980s, Denver did not. The 1971 publication serves as the only public document that, according to its own text, "gives the maximum chance of survival for you and your family."[111]

The truth is, by the time Community Shelter Plans across the country were being published the United States was entering a period of détente with the Soviet Union. Increased discussions of arms control and visits by President Richard Nixon to China and later to Moscow resulted in a relaxing of tensions. Mutually assured destruction no longer felt imminent. In 1973, subtly mirroring this easing, the Denver Office of Civil Defense was renamed the Emergency Preparedness Office. By the end of the decade, the federal OCD was brought under the umbrella of the newly established FEMA that was independent of the DoD.[112] Civil defense was no longer, in the words of the former Secretary of Defense Robert McNamara,[113] "an integral and essential part of our overall defense posture."[114]

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[110] Dallas City-County Civil Defense Disaster Commission, *Fallout Shelter in Dallas County,* (Dallas: Dallas City Planning Department, 1970); Suffolk County Department of Civil Defense, *Community Shelter Plan for Suffolk County,* (Hauppauge NY: Suffolk County Department of Planning, 1969); Franklin County, *Franklin County, Ohio Community Shelter Plan,* (Columbus: Parkins, Rogers & Associates, 1969); Lee Thomas O'Connor, *Take Cover Spokane: A History of Backyard Bunkers, Basement Hideaways, and Public Fallout Shelters of the Cold War,* (Spokane: Washington State University, 2010).

[111] Civil Defense and Disaster, "Community Shelter Plan," 23.

[112] Monteyne, *Fallout Shelter*, 275.

[113] Robert McNamara was Secretary of Defense from 1961-1968.

[114] Sperry, "Fallout Shelter Survey," 895.

CHAPTER VI

SHELTER TYPES

During World War II, very few air raid or bomb shelters were constructed in the United States or its territories, with the exception of Hawaii. The likelihood of an air raid on the island chain was much greater and civil defense groups constructed several different types of shelters. The simplest were air raid trenches, open pits four to five feet deep and four-and-a-half feet wide at the top, tapering to three feet. A corrugated metal sheet could be placed over the trench and covered with earth to provide a more substantial shelter.[115] In addition to trenches, which could be constructed by homeowners with no real skills, 600 splinter proof shelters were constructed around Oahu. These were partially buried, wood-framed structures with wooden benches inside. They were built on the grounds of schools, government buildings, and in other highly populated areas.[116] These shelters were designed to be used by the public in case an attack occurred during the day. Individual homeowners were responsible for constructing their own private shelters to be used if an air raid happened at night.

Following the end of World War II and the first successful Soviet test of an atomic bomb in 1949, the rest of the United States was forced to consider the necessity of shelters. As Monteyne points out in *Fallout: Designing for Civil Defense During the Cold War,*[117] the United States, unlike Switzerland who mandated shelter space for every citizen, chose to try and persuade Americans to make civil defense a priority. The first step was to educate the public on the effects of atomic weapons. The newly established FCDA began publishing booklets, creating newsreels, writing articles and newspaper columns, developing cartoons and films, and enlisting

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[115] University of Hawaii, "Hawai'i War Records Depository Photographs: Jan-June 1945," accessed July 2014, http://libweb.hawaii.edu/digicoll/hwrd/HWRD_html/HWRD42a.html.

[116] University of Hawaii, "Hawai'i War Records."

[117] Monteyne, *Fallout Shelter*, xiv.

well-known Hollywood stars to instruct Americans in civil defense directives.[118] The overriding theme of this media campaign was that an individual could survive an atomic blast, if they were prepared. Early FCDA plans called for nothing more than lying flat on the floor and covering your face with your arms.[119] However, the FCDA administrator believed that bomb shelters were an integral aspect of surviving an attack and lobbied for funds to create bomb shelter programs in each state. Congress and President Eisenhower rejected these requests and subsequent bills for shelter funding in 1951, 1952, and 1953.[120] Instead of providing money for the construction of shelters, the FCDA pushed Americans to construct their own by appealing to their patriotic duty. As a 1955 Denver civil defense pamphlet stated, "no one has the right to expect protection or the benefits and blessings of freedom unless he is willing to assume the obligations of citizenship."[121] As part of the civil defense media blitz, information regarding the construction of private bomb, and later fallout shelters, were distributed. Figures explained the percentage of radiation that passes though different building materials, showing that glass blocks less than 1% of radiation while 18 inches of concrete or 25 inches of earth block 99%[122].

In 1958 the Eisenhower Administration released its National Plan for Civil Defense. This plan addressed: continuity of government in the event of a nuclear attack; radiological defense including research and development of fallout shelters and monitoring of areas post-attack; development of emergency systems and equipment; training and information sharing with the American public; and "applied research directed toward the practical application of science to the

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[118] Orson Welles hosted a radio show in 1956 titled *Tomorrow* where he narrated the story of two cities under atomic attack: one city with a civil defense program and the other without. Harriet Hilliaird of *Ozzie and Harriet* modeled Civil Defense uniforms; Bob Hope and Johnny Cash appeared in Civil Defense public service announcements. Pamphlets produced by state and national civil defense groups include: "Dagwood Splits the Atom," "Survival Under Atomic Attack," "You and the Atomic Bomb," and "Just in Case Atom Bombs Fall." Filmstrips produced included *The Atom and You*, *Facts About Fallout*, and many others.

[119] Scheiback, "*In Case Atom Bombs Fall,"* 30.

[120] Rose, *One Nation Underground,* 24.

[121] Scheibach, "*In Case Atom Bombs Fall*," 115.

[122] Monteyne, *Fallout Shelter*, 49.

problems of civil defense."[123] The same year the FCDA merged with the Office of Defense Mobilization to form a new agency called the Office of Civil and Defense Mobilization (OCDM).[124] In 1959, the booklet, *The Family Fallout Shelter,* was released by the newly created OCDM. It was a how-to manual on constructing a shelter in the basement or backyard of a suburban residence.[125] The booklet provided maps that showed how radioactive fallout from a nuclear detonation would spread across the United States and summed up the danger as "**The lesson is: fallout shelter is needed everywhere.[126]**"

The realization that these private shelters would have limits on the number of occupants, whether because of size, amount of food and water stocked, or ventilation, led to the concept of "shelter morality."[127] Discussions about the ethics of protecting a private fallout shelter from unwanted entry by strangers or even neighbors became de rigueur in the 1960s. In 1961, *Time* magazine published an article about this titled, "Gun They Neighbor"; an episode of the popular television show *The Twilight Zone* titled, "The Shelter" examines what happens when during an atomic attack neighbors turn against the one family that constructed a fallout shelter; and churches even got involved publishing articles such as, "Ethics at the Shelter Doorway," where author Father McHugh stated that if strangers or neighbors were attempting to break into your private shelter they may be "repelled with whatever means will effectively deter their assault."[128]

Even as Americans experienced growing disillusionment with the concept of constructing private shelters, the OCDM continued to laud the idea, publishing pamphlets and creating traveling exhibits to illustrate how important preparation was. Monteyne explores the idea that

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[123] Office of Civil and Defense Mobilization (OCDM), "Annual Report of the Federal Civil Defense Administration for Fiscal Year 1958" (Washington D.C.: U.S. Government Printing Office, 1958): 24.

[124] OCDM, "Annual Report," ix.

[125] Like most Civil Defense booklets, pamphlets, and displays, the people constructing and taking refuge in private fallout shelters in *The Family Fallout Shelter* were entirely white suburban families.

[126] Monteyne, *Fallout Shelter*, 5.

[127] Rose, *One Nation Underground*, 93.

[128] Rose, *One Nation Underground*, 96.

civil defense officials believed that those who were upstanding and prepared could survive an atomic attack and that the worthy never "lived at a disadvantage on the margins of society."[129] This concept can be seen in the sanitized, all-white, middle-class, suburban communities that were at the heart of nearly all civil defense publications and films in the 1950s and early 1960s. The city center, predominately occupied by minorities and the poor, was ground zero and salvation lay in the suburbs.[130]

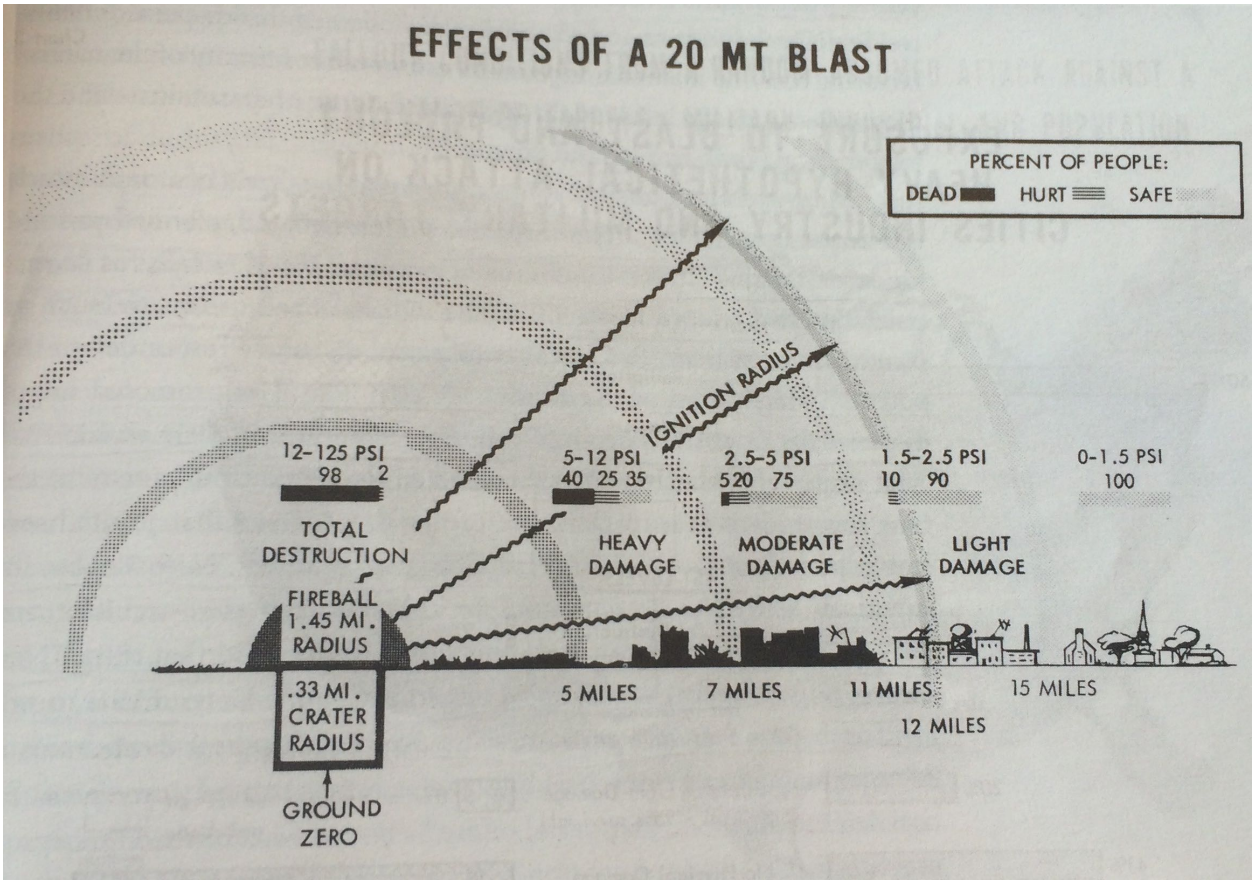

Figure 12. Blast Effects Showing Urban Devastation.[131]

[129] Monteyne, *Fallout Shelter*, 33.

[130] Discussions of the ramifications of these social relations can be found in Monteyne's *Fallout Shelter: Designing for Civil Defense*, Rose's *One Nation Underground*, and in many more books and articles.

[131] Monteyne, *Fallout Shelter*, 9.

By the end of 1960 a majority of Americans were skeptical of constructing private shelters, in part because of the politick surrounding the morality of private shelters and also because there were mixed messages from OCDM regarding the survivability of an atomic attack. As Rose notes in *One Nation Underground*, civil defense publications were wildly contradictory. In a 1961 booklet titled *Fallout Protection: What to Know and Do about Nuclear Attack*, the OCD stated that an attack would be, "terrible beyond imagination and description" while later going on to say that, "if effective precautions are taken in advance, it need not be a time of despair."[132] By late March 1960 estimates of fallout shelters constructed across America were incredibly low, numbering only 1,565 in 35 states.[133] If the United States was interested in proving to the Soviet Union that American citizens were prepared and ready for a nuclear attack then it was clear to newly sworn in President Kennedy and his administration that the government would have to take matters into their own hands.

Examples of NFSS Shelters

To better understand the kinds of buildings that were selected as public community fallout shelters I examined 210, or approximately 30%, of the fallout shelters identified in the Denver metropolitan area's 1971 Community Shelter Plan. Approximately 15% of these were within Denver's urban core; an area bounded, for the purpose of this study, by Colfax Avenue to the south, Washington Street to the east, I-25 to the west, and 38th Avenue to the north. The remaining 15% came from locations outside of the district, including buildings in Denver and also those in Aurora, Lakewood, Golden, Littleton, Arvada, Westminster, Englewood, and Wheat Ridge. The average construction date of buildings in each location was determined as was the most common construction material and building use.

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[132] Rose, *One Nation Underground*, 78.

[133] Rose, *One Nation Underground*, 79.

Denver Urban Core

Public fallout shelters in Denver's urban core were not homogenous. The average construction date for buildings with shelters in downtown Denver was 1908. The oldest building was the 1889 Denver Dry Goods building and the most recent was the 1969 Currigan Hall. Building use also varied dramatically: 17% of the shelters were located in warehouses, 13% were in apartments or condominium buildings, 15% were in retail or department stores, and 10% were in schools. The remaining 45% were hotels and motels, nursing homes, offices, manufacturing plants, parking structures, public utility buildings, fire stations, and churches, as well as federal or state buildings, including post offices and courthouses.

One characteristic the buildings with public shelters shared, however, was construction material type. The most common building material was stone followed by brick masonry and then concrete. In fact, only one building had cladding that was not masonry—Currigan Hall. This building was ideally suited for a public fallout shelter not because of its CorTen steel construction material but because of its sheer size. As mentioned previously there are two types of shielding methods: barrier shielding, where the mass of the building or earth protects those in the shelter; and geometric shielding where distance from the extent of the fallout field provides protection. In 1969 Currigan Hall was the world's largest rigid space frame building and thus offered enough geometric shielding to serve as a public shelter.

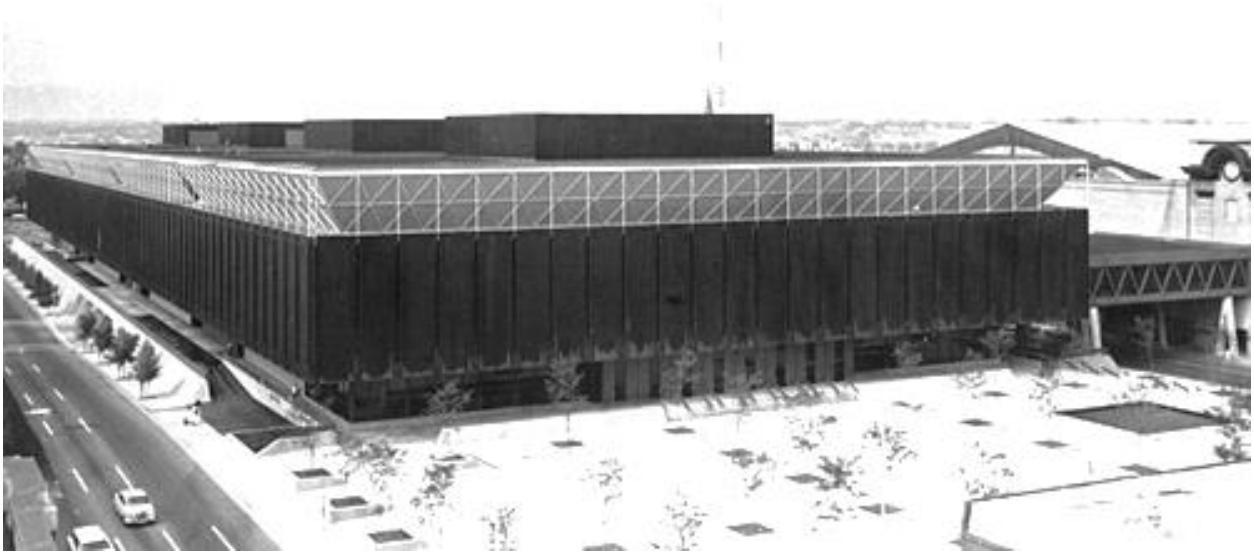

Figure 13. Currigan Hall.[134]

Exceptions aside, most public shelters in Denver's urban core were located in the basement or first or second floors of brick or stone masonry buildings between 1 and 10 stories high. On average they could house 50–150 people for two weeks. None were modified through ventilation kits or the addition of earth or other material that might have provided a higher PF. The YMCA at East 16th Avenue and Lincoln Street is a typical example. The Neo-Classical Revival style building is constructed of hard-fired brick masonry and the basement walls are coursed ashlar stone masonry. Both of these materials block radiation from entering the building. Though the building has regularly spaced double-hung windows, these openings allow much less infiltration of radiation than the floor to ceiling windows found in many buildings in Denver's urban core. If the fallout shelter was located in an interior room in the basement of this building, the PF could be as high as 250.

[134] Marqlab, "Marqlab," accessed January 2015, http://www.marqlab.com/.

Figure 14. Downtown Denver Central YMCA.

Metropolitan Area

Unlike buildings in the urban core, buildings with public fallout shelters throughout the metropolitan area are remarkably similar both in use and in construction material. The average construction date of buildings with fallout shelters is 1955, which is not surprising given the later development of neighborhoods outside the city center. Nearly all of the buildings with fallout shelters are wood frame with brick veneer cladding. The notable exceptions are: stone masonry churches and mortuaries, including the Tower of Memories at Crown Hill Cemetery in Wheat Ridge; the Federal Correctional Institution in Littleton, constructed of poured concrete and concrete masonry units; tunnels at Ralston Reservoir in Jefferson County; and the Cherry Creek Dam outlet structure in Aurora.

Figure 15. Federal Correctional Institution in Englewood.[135]

However, the majority of public fallout shelters in the metropolitan areas are located in one and two story brick veneer buildings. The lack of office buildings used for public shelters in the suburban environment is not surprising. By 1955, the average construction age of buildings in this area, curtain wall buildings were growing in popularity. With their glass walls and thin floors,[136] these buildings would serve as poor protection against fallout, even with the presence of a basement.

[135] "FCI Englewood," accessed January 2015, http://www.bop.gov/locations/institutions/eng/.

[136] A thin floor as defined by the OCD in 1961 is 50 pounds per square feet or less.

Figure 16. Typical brick veneer construction. Denver Fire Station #19.[137]

Unlike urban core fallout shelters, suburban shelters are located in a relatively few types of buildings: basements of apartment buildings, nursing homes, hospitals, and schools. While these buildings might make good shelters due to their structural components, there is a larger complication in their selection. Unlike office, retail, and warehouse buildings, suburban shelter spaces were densely occupied for a majority of the day. It can be assumed that if an attack occurred during the working day, the occupants of hospitals and schools and nursing homes would utilize the shelter, leaving limited space for the public.

[137] "300 South Ivy," accessed January 2015, https://www.google.com/maps/@39.710806,-104.92112,3a,75y,86.07h,95.13t/data=!3m4!1e1!3m2!1sG_sBQAzS1xP-Y-_pdRPM6Q!2e0.

Figure 17. Hidden Lake High School, Westminster.[138]

Dallas, Texas—A Comparison

While many cities in the nation follow Denver's pattern—oldest and best fallout shelter spaces in the urban core with dwindling options in the metropolitan area—some do not. Dallas is a notable example. According to Harvey Graff in his book, *The Dallas Myth: The Making and Unmaking of an American City,* "no Dallas-area institution took responsibility for initiating and supporting programs to collect or preserve, study, interpret, and present Dallas past or present."[139] Many of Dallas' significant historic buildings, sites, and structures were lost to development by the 1970s. Due to the presence of railroads in Dallas' central business district, construction in the urban core was limited to three streets until the lines were removed in 1926.[140]

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[138] Colorado Preservation Inc., "Schools From the 1950s in Colorado," accessed January 2015, http://coloradopreservation.org/crsurvey/schools/sites/hs_1950s_page2.html.

[139] Harvey J. Graff, *The Dallas Myth: The making and Unmaking of an American City,"* (Minneapolis: University of Minnesota Press, 2008), 71.

[140] Graff, *The Dallas Myth*, 188.

This unique development history can be seen in Dallas' Community Shelter Plan. Produced in 1971, the plan appears to follow the same trend as Denver. More than 200 shelters in the urban core with fewer shelters as you move towards the suburbs. However, the average construction date of buildings with fallout shelters in Dallas' urban core is 1953, nearly the same as buildings with shelters in Denver's suburbs.

CHAPTER VII

CONCLUSIONS

Though federal and local Offices of Civil Defense across the country tried to persuade Americans that a nuclear attack could be survived, they were stymied by their own efforts to also make nuclear attacks a real threat that was worthy of building and seeking fallout shelters. The hundreds of OCD publications and films warning that death from above was imminent did not persuade the public to build private shelters but instead convinced Americans that surviving was likely impossible and that any survivors would be greeted by the nuclear apocalypse waiting outside the shelter door. These inconsistencies, coupled with reversals in OCD policies regarding sheltering in place and evacuation, doomed the efforts of the NFSS program.

Furthermore the program itself was flawed. The complexities of locating shelters for day and night populations was quickly dropped in favor of locating shelters for the total population and leaving the planning to the general public. City after city across the nation touted that it had located shelter spaces for its entire populace while ignoring the fact that during an actual emergency many shelters would sit unfilled or empty while others would turn people away. Local civil defense offices found the logistics of storing and stocking shelter supplies to be nearly impossible. The mandate to monitor the supplies and update the fallout shelter lists went largely ignored. As city and state officials struggled to create shelter plans and maps, the federal government stepped in with the Community Shelter Plan. But by the time shelters were marked, stocked, and maps of their locations distributed to the public, the country had entered a thawing of relations with the Soviet Union.

The built environment of the city itself did its part to complicate matters. The innovations that allowed for the construction of skyscrapers and quick assembly of homes created buildings that were not suitable for use as fallout shelters. The development of suburbs pulled the populace away from urban cores where, in many cities, the buildings that were most appropriate to serve as fallout shelters were located: older masonry buildings with basements constructed with

concrete, brick, or stone. As the city core was abandoned, the buildings fell into disrepair and just as the NFSS began in earnest so did urban renewal. Massive, thick-walled buildings were torn down in favor of highways, parking lots, and modern office towers. This was a loss of significant buildings, not just for preservationists, but for civil defense planners as well.

When the threat of nuclear attack waned during the late Cold War, what became of the remaining public community fallout shelters? Some building owners removed their shelter signs, while others did not even bother to go to the trouble. Others such as fire and police stations and local and state governmental offices were required to keep their shelter spaces and signs up. Although the supplies were removed from many shelters, there was no federal process for the systematic removal of these materials. Many public fallout shelters spaces were boarded up or sealed off and soon forgotten. Two recent news stories highlight this. In February 2012 a construction crew working on Lower Wacker Drive in Chicago pulled down a viaduct wall and discovered a public fallout shelter that had been sealed off from the building adjacent to the road. Inside was a complete allocation of OCD supplies: barrels of water, sanitation kits, food, radiation monitoring equipment, and medical supplies. The building owners stated that they had no idea the sealed-off room was there.[141] In June of the same year a fully stocked public fallout shelter was located in Auburn, California. Volunteers were painting a weightlifting room at Placer High School when they came upon a small locked door. Upon opening the door, they found an intact shelter with a complete set of supplies. Again, school administrators had no idea the room was there.[142]

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[141] Frank Mathie, "City Crews Uncover Cold War Cache," last modified February 1, 2012, http://abc7chicago.com/archive/8527569/.

[142] Huffington Post, "Cold War Bomb Shelter Found at Placer High School," last modified June 29, 2012, http://www.huffingtonpost.com/2012/06/27/cold-war-bomb-shelter-placer-high-school_n_1632250.html.

Figure 18. OCD supplies found at Placer High School.[143]

Public fallout shelters represent a unique and important part of America's Cold War history and one that is almost completely overlooked by historians and preservationists. As mentioned previously, the only fallout shelters that have been studied or surveyed as a cultural resource are the few extraordinary purpose built shelters such as: President Kennedy's fallout shelter on Peanut Island, Florida; the Congressional fallout shelter at Greenbrier Resort in West Virginia; and the Artesia, New Mexico, elementary school that was built entirely underground.[144] The NFSS shelters, while not purpose built, are a significant aspect of American life that has largely been ignored.

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[143] "Cold War Bomb Shelter Found at Placer High School," last modified June 29, 2012, http://www.huffingtonpost.com/2012/06/27/cold-war-bomb-shelter-placer-high-school_n_1632250.html.

[144] This short list does not represent all of the fallout shelters that have been studied; however, it is only these types of purpose built shelters that have managed to garner attention in the preservation community.

There are few tangible artifacts of the civilian Cold War experience and it is crucial that they not be forgotten. The NFSS shelters symbolize federal policy concerns but also localized interests. The locating, marking, and stocking of shelters and the preparation that went into the creation of Community Shelter Plans, while pushed by leaders at the national level, were carried out by local governments, using local architects, engineers, planners, and developers. They required an extraordinary level of effort and cooperation and their preservation is essential to understanding the complexities of each city's development, which is essential to truly understanding the city itself.

Furthermore, the NFSS public fallout shelters are important Cold War-era resources. The NFSS shelters were not purpose built and most were constructed before the implementation of the survey program; they do not easily fit into NRHP criteria categories. These buildings do not look like traditional Cold War-architecture; however, because of the buildings' use, or intended use, as fallout shelters and their association with the NFSS program, they become Cold War buildings. In the introduction of Cupers' book *Use Matters: An Alternative History of Architecture*, he states "if architecture's meaning is made not on the drafting board but in the complex lifeworld of how it is inhabited, consumed, and used, lived, or neglected, the world is at once centrally and peculiarly under-explored."[145] NFSS public fallout shelters are more than their construction date or their architectural style. They are significant resources worthy of recognition and preservation.

[145] Kenny Cupers, ed., *Use Matters: An Alternative History of Architecture*, (New York: Routledge, 2013), 1.

BIBLIOGRAPHY

American Institute of Architects. “Design for Survival: Architects’ Involvement in Security Design Dates to Early Cold War Years.” Accessed December 2014. http://www.aia.org/akr/Resources/Documents/AIAP037354.

Amundson, Michael. “Uranium on the Cranium: Uranium Mining and Popular Culture.” In *Atomic Culture: How We Learned to Stop Worrying and Love the Bomb,* ed. Scott C. Zeman and Michael A. Amundson, 51-66. Boulder: University of Colorado Press, 2004.

Ball, Deborah. Wall Street Journal, "Swiss Renew Push for Bomb Shelter." Last modified 2011. Accessed November 2012. http://online.wsj.com/article/SB10001424052702304231204576405700994655570.html.

Bureau of Prisons. “FCI Englewood.” Accessed January 2015. http://www.bop.gov/locations/institutions/eng/.

Civil Defense and Disaster. “Community Shelter Plan,” *Denver Post*, March 10, 1971. Supplement, 1-25.

Cohen, Wilbur J., and Evelyn F. Boyer. "Federal Civil Defense Act of 1950: Summary and Legislative History." *Social Security Bulletin*. April. (1951): 11-16.

Colorado Preservation Inc. “Schools From the 1950s in Colorado.” Accessed January 2015. http://coloradopreservation.org/crsurvey/schools/sites/hs_1950s_page2.html.

Cupers, Kenny, ed. *Use Matters: An Alternative History of Architecture*. New York: Routledge, 2013.

Dallas City-County Civil Defense Disaster Commission. *Fallout Shelter in Dallas County.* Dallas: Dallas City Planning Department, 1970.

Davis, Tracy. *States of Emergency: Cold War Nuclear Civil Defense*. Durham NC: Duke University Press, 2007.

Denver Office of Civil Defense. *Basic Principals of Civil Defense*. Denver: Office of Civil Defense, May 1952.

———. *Civil Defense Committee on Evacuation*. Denver: Office of Civil Defense, 1955.

Denver Post. “1965 South Platte Floods.” Accessed August 2014. http://blogs.denverpost.com/library/2013/06/14/1965-south-platte-river-floods/8735/.

———. “Jefferson Lists CD Shelters.” October 28, 1962.

Denver Public Library. *A Disaster Plan for You,* 1964. Thomas Currigan Papers, WH929. Western History Collection.

———. “Civil Defense Basic Plan, January 28, 1963.” Thomas Currigan Papers, WH929. Western History Collection.

———. “Inter-Office Correspondence August 19, 1963.” Thomas Currigan Papers, WH929. Western History Collection.

———. “Letter from Charles D Strong to Mayor Thomas Currigan, 10 July 1968.” Thomas Currigan Papers, WH929. Western History Collection.

———. “Letter from Mayor Thomas Currigan’s Office to Charles D. Strong, 17 July 1968.” Thomas Currigan Papers, WH929. Western History Collection.

———. “Memo from Col. W.M. Allen Jr., Director of Civil Defense, 21 May 1968.” Thomas Currigan Papers, WH929. Western History Collection.

———. “Press Release, January 22, 1962.” Richard Y. Batterton Papers, WH734. Western History Collection.

———. “Press Release, July 14, 1966.” Thomas Currigan Papers, WH929. Western History Collection.

———. “Prototype Community Shelter.” Richard Y. Batterton Papers, WH734. Western History Collection.

———. “Shelter Program, 10 November 1965.” Thomas Currigan Papers, WH929. Western History Collection.

Department of Defense (DOD). “Status of the Civil Defense Program, April 1969.” FEMA website. http://training.fema.gov/hiedu/docs/historicalinterest/office%20of%20civil%20defense%20-%20april%201969%20-%20status%20of%20the%20civil%20defense%20program.pdf.

Dylan , Bob. "Let Me Die in My Footsteps." *The Bootleg Series, Vol 1-3: Rare & Unreleased 1961-1991*. Recorded 1962. Columbia. Web, http://www.bobdylan.com/us/music/the-bootleg-series-vol-1-3-rare-and-unreleased-1961-1991.

Federal Civil Defense Administration. *Annual Report of the Federal Civil Defense Administration for Fiscal Year 1958*. Washington D.C.: U.S Government Printing Office, 1958.

Federal Highway Administration. “Federal-Aid Highway Act of 1956: Creating the Interstate System.” Accessed December 2014. http://www.fhwa.dot.gov/publications/publicroads/96summer/p96su10.cfm.

Franklin County. *Franklin County, Ohio Community Shelter Plan.* Columbus: Parkins, Rogers & Associates, 1969.

Freeman, Richard. “The 1949 Housing Act versus ‘urban renewal.” *Executive Intelligence Review* 23 No. 50 (1996): 27.

Gelernter, Mark. *A History of American Architecture: Buildings in Their Cultural and Technological Context*. Hanover N.H.: University of New England Press, 1999.

Google. “300 South Ivy.” Accessed January 2015. https://www.google.com/maps/@39.710806,-104.92112,3a,75y,86.07h,95.13t/data=!3m4!1e1!3m2!1sG_sBQAzS1xP-Y-_pdRPM6Q!2e0.

Graff, Harvey J. *The Dallas Myth: The making and Unmaking of an American City.”* Minneapolis: University of Minnesota Press, 2008.

Healy, J.H., and W.W. Rubey, D.T. Griggs, C.B. Raleigh. “The Denver Earthquakes.” *Science* 161, No. 3848. (1968): 1301-1310.

Huffington Post. “Cold War Bomb Shelter Found at Placer High School.” Last modified June 29, 2012. http://www.huffingtonpost.com/2012/06/27/cold-war-bomb-shelter-placer-high-school_n_1632250.html.

Inter-County Regional Planning Commission (ICRP). “Community Shelter Planning, Denver Region, January 22, 1965.” Available at Western History Collection, Denver Public Library.

Kennedy, John. “A Message to You From the President.” *Life*, September 16, 1961, 95.

Mariani, Daniele. Swiss Info, "Bunkers for all." Last modified 2009. Accessed November 2012. http://www.swissinfo.ch/eng/specials/switzerland_for_the_record/world_records/Bunkers_for_all.html?cid=995134.

Marqlab. “Marqlab.” Accessed January 2015. http://www.marqlab.com/.

Mathie, Frank. “City Crews Uncover Cold War Cache.” Last modified February 1, 2012. http://abc7chicago.com/archive/8527569/.

McNeil, Allison. *American Homefront in World War II: Almanac*. Farmington Hills: UXL, 2004.

Monteyne, David. *Fallout Shelter: Designing For Civil Defense in the Cold War*. Minneapolis : University of Minnesota Press, 2011.

National Archives. “An act to amend and supplement the Federal-Aid Road Act approved July 11, 1916, to authorize appropriations for continuing the construction of highways; to amend the Internal Revenue Code of 1954 to provide additional revenue from the taxes on motor fuel, tires and trucks and buses; and for other purposes; June 29, 1956;” Enrolled Acts and Resolutions of Congress, 1789-1996. General Records of the United States Government. Record Group 11.

———. “Fallout Shelter Stocking, 01/22/1963.” Fallout Shelters/Civil Defense 5/5/60 - 1/22/63, 05/05/1960 - 01/22/1963. Construction Project Photographs 1927 – 1981. Records of the Office of the Chief of Engineers, 1789 – 1999.

National Park Service (NPS). “National Register Bulletin No. 15.” Accessed September 2014. http://www.nps.gov/nR/publications/bulletins/nrb15/.

O'Brian, John and Jeremy Borsos. *Atomic Postcards: Radioactive Messages from the Cold War.* Chicago: University of Chicago Press, 2011.

O'Connor, Lee Thomas. *Take Cover Spokane: A History of Backyard Bunkers, Basement Hideaways, and Public Fallout Shelters of the Cold War.* Spokane: Washington State University, 2010.

Office of the Chief of Engineers. *Fallout Shelter Survey Instructions*. Washington D.C.: Government Printing Office, 1961.

———. *Fallout Shelter Survey Instructions*. Washington D.C.: Government Printing Office, Nov 1961. Annex B-1. Revised 15 March 1962.

Office of Civil Defense (DOD OCD). *1969 Annual Report of the Office of Civil Defense*. Washington D.C.: U.S. Government Printing Office, 1969.

———. "Community Shelter Planning." Accessed May 2014. http://www.youtube.com/watch?v=FwXE568WnXg.

———. *Functions and Responsibilities of Building Owners, Local Governments, State Governments in the National Fallout Shelter Program.* Washington D.C.: U.S. Government Printing Office, 1962.

Office of Civil and Defense Mobilization (OCDM). "Annual Report of the Federal Civil Defense Administration for Fiscal Year 1958." Washington D.C.: U.S. Government Printing Office, 1958.

Pearce, Ken. "Denver CD Locates 116 Fallout Shelters." *Denver Post*, 24 October 1962.

Plimpton, Kathryn. Personal Collection. August 2013.

Resche, John Phillips. *Americans at War: Society, Culture, and the Homefront*. New York: Macmillan Reference USA, 2004.

Rose, Kenneth D. *One Nation Underground: The Fallout Shelter in American Culture*. New York: New York University Press, 2001.

Salmon, John S. *Protecting America: Cold War Defensive Sites A National Historic Landmark Theme Study*. Washington D.C: U.S. Department of the Interior, 2011.

Scheiback, Michael. *"In Case Atom Bombs Fall" An Anthology of Governmental Explanations, Instructions and Warning from the 1940s to the 1960s*. Jefferson: McFarland & Company, 2009.

Sperry, Kathleen "Fallout Shelter Survey: Civil Defense Says There Is No Place Like Home." *Science* 158 No. 3803 (1967): 894-895.

Suffolk County Department of Civil Defense. *Community Shelter Plan for Suffolk County.* Hauppauge NY: Suffolk County Department of Planning.

Szasz, Ferenc M. and Issei Takechi, “Atomic Heroes and Atomic Monsters: American and Japanese Cartoonists Confront the Onset of the Nuclear Age, 1945-1980.” *The Historian* 69 (2007): 728-752.

Teaford, Jon C. *The Metropolitan Revolution: The Rise of Post-Urban America.* New York: Columbia University Press, 2006.

University of Hawaii. “Hawai’i War Records Depository Photographs: Jan-June 1945.” Accessed July 2014. http://libweb.hawaii.edu/digicoll/hwrd/HWRD_html/HWRD42a.html.

U.S. Census Bureau. “Population of Counties by Decennial Census, Colorado.” Last modified March 1995. http://www.census.gov/population/cencounts/co190090.txt.

USGS. “Colorado:Earthquake History.” Accessed August 2014. http://earthquake.usgs.gov/earthquakes/states/colorado/history.php.

Wigner, Eugene. *Who Speaks for Civil Defense?* New York: Scribner, 1968.