

**Within the Fence Line:
Spatial Analysis of Naval Station Bremerton**

Beau Sisemore

A thesis
submitted in partial fulfillment of the
requirements for the degree of

Master of Urban Planning

University of Washington

2025

Committee:

Branden Born

Christopher Campbell

Program Authorized to Offer Degree:

Urban Design and Planning

©Copyright 2025

Beau Sisemore

University of Washington

Abstract

Within the Fence Line: Spatial Analysis of Naval Station Bremerton

Beau Sisemore

Chair of the Supervisory Committee:

Branden Born

Department of Urban Design and Planning

This thesis compares contemporary military planning codes with widely accepted civilian land use planning practices using Naval Station Bremerton as a case study. Military installations prioritize security, efficiency, and operational effectiveness, which often contrast with urban planning principles that emphasize mixed-use development, walkability, and community cohesion. This study addresses two primary research questions: 1) How do small urban space design practices compare to the planning codes and regulations of Naval Station Bremerton? 2) Where do these frameworks align, and where do they diverge? Through a systematic literature review and comparative analysis of base master plans, Department of Defense land-use policies, and Unified Facilities Criteria (UFC), the research explores the intersection of military and urban planning principles, particularly in areas such as land-use mix, density, pedestrian accessibility, and public space integration. The findings highlight areas where flexibility exists within military planning regulations and offer insights into improving military base land use and design, balancing operational effectiveness with enhanced livability and functionality.

Acknowledgments

I want to recognize and express my sincere gratitude to those who provided their time, effort, and feedback throughout my graduate studies at the University of Washington. I thank my partner in life, Nancy, and my children, Luna and Sebastian, for their limitless patience and love during the development of this thesis. To my thesis committee, Branden Born and Christopher Campbell, who provided the academic expertise and guidance necessary for me to achieve this scholarly milestone. To my cohort of graduate peers, a group of outstanding creatives, intellectuals, and good-hearted people who shared generously their vast knowledge and incredible perspectives with me during our time together. Finally, I thank the U.S. Navy and the Civil Engineer Corps community I have the honor of being a member of, which has provided me with countless opportunities, exceptional mentors, strong friendships, and overwhelming support for my educational and professional growth throughout the past decade. I could not have reached this point without all of you.

Table of Contents

| | |
|--|----|
| Acknowledgments..... | 4 |
| List of Figures..... | 8 |
| List of Tables | 9 |
| Chapter 1 Introduction | 10 |
| 1.1 Research Context | 11 |
| 1.2 Research Question | 13 |
| 1.3 Research Approach..... | 14 |
| 1.4 Document Structure | 16 |
| Chapter 2 Research Methods | 17 |
| 2.1 Research Design and Approach..... | 17 |
| 2.2 Design Principles Analysis | 18 |
| 2.2.1 Military Planning Documents..... | 18 |
| 2.2.2 Identifying Civilian Urban Planning Policies for Comparison..... | 19 |
| 2.3 Comparison Through Literature Review | 20 |
| 2.4 Site Analysis | 21 |
| 2.4.1 Analytical Process..... | 22 |
| 2.5 Comparative Framework for Findings..... | 22 |
| 2.6 Limitations of Methodology | 23 |
| 2.6.1 Restricted Access to Military Documents..... | 23 |
| Chapter 3 Design Principles Analysis..... | 24 |
| 3.1 Theoretical Foundations of Urban Design and Spatial Planning..... | 25 |
| 3.1.1 Urban Fabric and Connectivity..... | 30 |
| 3.1.2 Walkability and Public Spaces..... | 30 |
| 3.1.3 Crime Prevention Through Environmental Design (CPTED)..... | 32 |

| | |
|---|----|
| 3.2 Military Land Use Planning Frameworks..... | 33 |
| 3.3 Security-Driven Planning and Design Considerations | 39 |
| 3.3.1 The Impact of Security Regulations on Base Urbanism..... | 42 |
| 3.4 Gaps in Literature and Contributions..... | 46 |
| Chapter 4 Site Analysis..... | 47 |
| 4.1 Spatial Analysis of Naval Station Bremerton | 47 |
| 4.1.1 Land Use Patterns on Base | 52 |
| 4.1.2 Security Zones | 54 |
| 4.1.3 Density and Organization | 56 |
| 4.1.4 Connectivity & Mobility..... | 57 |
| 4.1.5 Public Space Design | 60 |
| 4.1.6 Open and Green Spaces | 61 |
| 4.1.7 Lynch Diagram | 63 |
| Chapter 5 Discussion | 66 |
| 5.1 Interpretation of Findings | 66 |
| 5.1.1 Tension Between Walkability and Security..... | 68 |
| 5.1.2 Housing and Mixed-Use Development Are Restricted by Security Priorities | 69 |
| 5.1.3 Public Spaces and Alternative Security Approaches..... | 69 |
| 5.1.4 Wayfinding and Navigation Enhancements Align with Best Practices..... | 70 |
| 5.1.5 Balancing Traffic and Security Needs | 70 |
| 5.1.6 Community-Oriented Design Remains Secondary to Mission Readiness..... | 71 |
| 5.1.7 Buffer Zones as a Compromise Between Security and Urban Design | 71 |
| 5.2 Alignment: Where Military Environments and Urban Design Intersect | 71 |
| 5.3 Divergence: Where Military Environments and Urban Design Conflict..... | 72 |
| 5.4 Implications for Integration Between Military and Civilian Frameworks..... | 73 |

| | |
|--|----|
| 5.4.1 Mixed-Use versus Functional Separation | 75 |
| 5.4.2 Pedestrian versus Auto-Centric Infrastructure..... | 75 |
| 5.4.3 Public Space Limitations | 76 |
| 5.5 Challenges and Future Research Directions | 76 |
| 5.5.1 Comparative Case Studies Across Other Bases..... | 77 |
| 5.5.2 Qualitative Research on Social Dynamics..... | 78 |
| 5.6 Limitations | 79 |
| 5.6.1 Scope and Generalizability | 79 |
| 5.6.2 Data Constraints..... | 79 |
| 5.6.3 Methodological Considerations | 80 |
| 5.6.4 Policy and Implementation Challenges | 80 |
| 5.7 Conclusion | 81 |
| 5.7.1 Land Use and Accessibility Impact Community Integration..... | 81 |
| 5.7.2 Urban Fabric and Connectivity Matter | 81 |
| Bibliography | 82 |

The views expressed in this thesis are those of the author and do not reflect the official policy or position of the United States Navy, Department of Defense, or the U.S. Government

List of Figures

| | |
|---|----|
| <i>Figure 1: Map of Kitsap County and Naval Base Kitsap Locations</i> | 10 |
| <i>Figure 2: Diagram of Conceptual Relationship Between Elements of Research Topic</i> | 13 |
| <i>Figure 3: Murray State University Campus Planning with 5-, 10-minute Walking Circles. From: Element Design. http://www.element-site.com/master-planning.....</i> | 31 |
| <i>Figure 4: Hierarchy of Space with Arrows Delineating Movement Between Space. From Defensible Space.</i> | 32 |
| <i>Figure 5: Standoff Distance. From UFC 4-020-01.</i> | 43 |
| <i>Figure 6: Creating Standoff by closing roads.</i> | 43 |
| <i>Figure 7: Unobstructed Space. From UFC 4-020-01</i> | 44 |
| <i>Figure 8: New standoff distance requirements.</i> | 44 |
| <i>Figure 9: Aerial Image and Tracing of Naval Station Bremerton.....</i> | 50 |
| <i>Figure 10: Figure Ground</i> | 51 |
| <i>Figure 11: Aerial Image Depicting Key Buildings and Area Surrounding and on Naval Station Bremerton.....</i> | 52 |
| <i>Figure 12: Functional Zones of Naval Station Bremerton</i> | 53 |
| <i>Figure 13: Security Perimeter and Entry Points</i> | 54 |
| <i>Figure 14: Level of Security Zones on Base</i> | 55 |
| <i>Figure 15: Figure Ground of Naval Station Bremerton.....</i> | 56 |
| <i>Figure 16: Figure Ground with Road Network.....</i> | 59 |
| <i>Figure 17: Aerial Map with Green Space Highlighted.</i> | 61 |
| <i>Figure 18: Lynch Diagram of Naval Station Bremerton</i> | 63 |

List of Tables

| | |
|--|----|
| Table 1: Urban Design Principles Matrix | 27 |
| Table 2: Urban Design Principles Heatmap..... | 29 |
| Table 3: Military Planning Guidelines Matrix..... | 36 |
| Table 4: Military Planning Guidelines Heatmap | 37 |
| Table 5: Summary of Comparison Between Design Elements and Military Planning Guidelines | 48 |
| Table 6: Summary of Security Levels on Integration of Design Principles | 67 |

Chapter 1 Introduction

The Puget Sound region has long served as a strategic hub for U.S. military operations due to its proximity to major metropolitan centers, with its diverse natural landscapes as the backdrop. It is home to Naval Base Kitsap, Naval Station Everett, and other military installations that are involved in a complex relationship between military presence and civilian urban development. Figure 1 depicts the locations of these major installations that partner with neighboring communities to develop land use plans, policies, and regulations that support U.S.

Department of Defense (DoD) missions as well as

community development goals. These installations not only support national defense but also contribute significantly to the regional economy, employing tens of thousands of civilians and generating billions in economic activity annually. Specifically, Naval Station Bremerton is considered the primary driver behind the City of Bremerton's designation as a regional growth center (PSRC, 2019; Kitsap Economic Development Alliance, 2018). However, the physical and social integration of these military bases with their surrounding communities presents unique challenges, particularly in terms of urban planning and land use compatibility. The juxtaposition of distinct urban forms—rigidly planned military installations and organically developed civilian neighborhoods—creates opportunities to study how alternative land use decisions on military bases could influence community interactions and spatial connectivity within the fence lines.

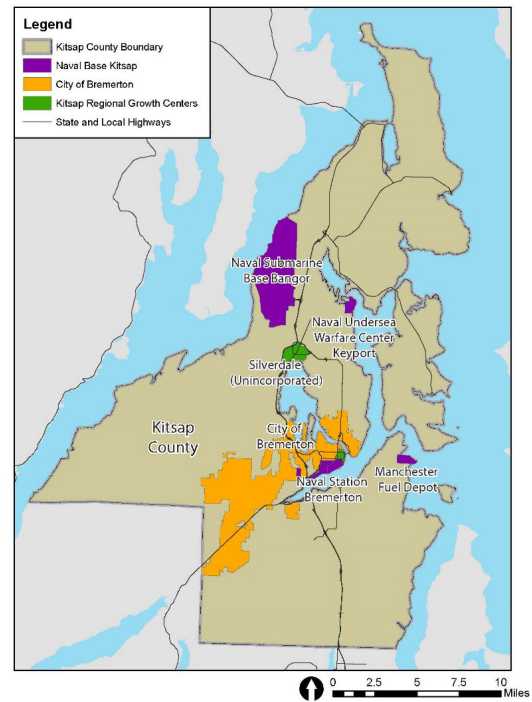


Figure 1: Map of Kitsap County and Naval Base Kitsap Locations (Source Data: Washington Geospatial Open Data Portal)

1.1 Research Context

Naval Station Bremerton exemplifies the complex relationship between military land use planning and civilian urban development. The Naval Station was established in 1891 due to its strategic location for a dry dock and various repair facilities along the West Coast (McClary, 2011). Military installations, by design, prioritize security, efficiency, and operational readiness, resulting in spatial configurations that often contrast with the principles of contemporary urban planning, which emphasize walkability, mixed-use development, and community cohesion. The juxtaposition of these two approaches presents an opportunity to analyze how land use frameworks within active military bases align with or diverge from broader urban design and planning principles. While military bases function as self-contained environments, their land use decisions extend beyond the fence line, shaping interactions between service members, their families, and the surrounding civilian communities. Decisions regarding base amenities, housing, and waterfront access influence patterns of mobility, accessibility, and social integration, raising important questions about the adaptability of military planning to contemporary urban planning practices.

The built environment significantly influences how communities function, interact, and evolve. Urban design focuses on understanding urban areas' spatial patterns and physical forms made up of elements such as street layouts, lot configurations, and building arrangements, which are often referred to collectively as urban grain or urban fabric. A widely cited source for a concise yet comprehensive definition of urban design is Larice and Macdonald's *The Urban Design Reader*, which brings together foundational readings on the subject. They characterize urban design as the discipline that shapes and organizes the spatial components of a city—streets, buildings, open spaces—in a manner that influences both human experience and the functionality of the urban environment. A key point in their work is the emphasis on

understanding the “urban grain” or “urban fabric” as central to how people move through and inhabit urban spaces (Larice et al, 2013). These patterns shape how people navigate and use space, influencing social and economic interactions. Concepts such as connectivity, walkability, and land use diversity have become foundational indicators in fostering interactions within communities. Through tools like Geographic Information Systems (GIS), urban designers and planners analyze these spatial elements, comparing patterns across geographies and over time to uncover how the built environment shapes community dynamics.

Despite the significant role of military installations in regional urban landscapes, they remain underexamined in urban planning research. Existing literature has focused largely on base redevelopment following closures or the economic impact of military presence, with limited analysis of active installations as dynamic urban entities. Military installations present a distinct and largely underexplored urban form. A recent source that frames military bases as a unique, under-researched urban form is “Walkable City and Military Enclaves: Analysis and Decision-Making Approach to Support the Proximity Connection in Urban Regeneration.” The authors highlight that military installations operate under specialized planning constraints, primarily driven by security and operational imperatives, making their spatial organization distinct from typical urban areas. They also underscore that scholarly attention to these enclaves remains comparatively sparse, especially as active contributors to urban form (Balletto et al, 2022).

By investigating the land use structure of Naval Station Bremerton, this research seeks to contribute to the understanding of military bases as evolving spatial environments, offering insights into how planning frameworks influence social cohesion and quality of life within active installation boundaries. These sites blend characteristics of isolated compounds, designed for security and operational efficiency, with aspects of urban entities to support residential,

recreational, and commercial functions. This duality raises questions about the spatial dynamics of military installations.

1.2 Research Question

This study contributes to our understanding of military bases as sites for urban design by investigating the relationship between military land use planning and contemporary urban design, using the spatial organization of Naval Station Bremerton as a case study. Figure 2 diagrams elements of this topic that formed the research questions. Specifically, it asks two questions:

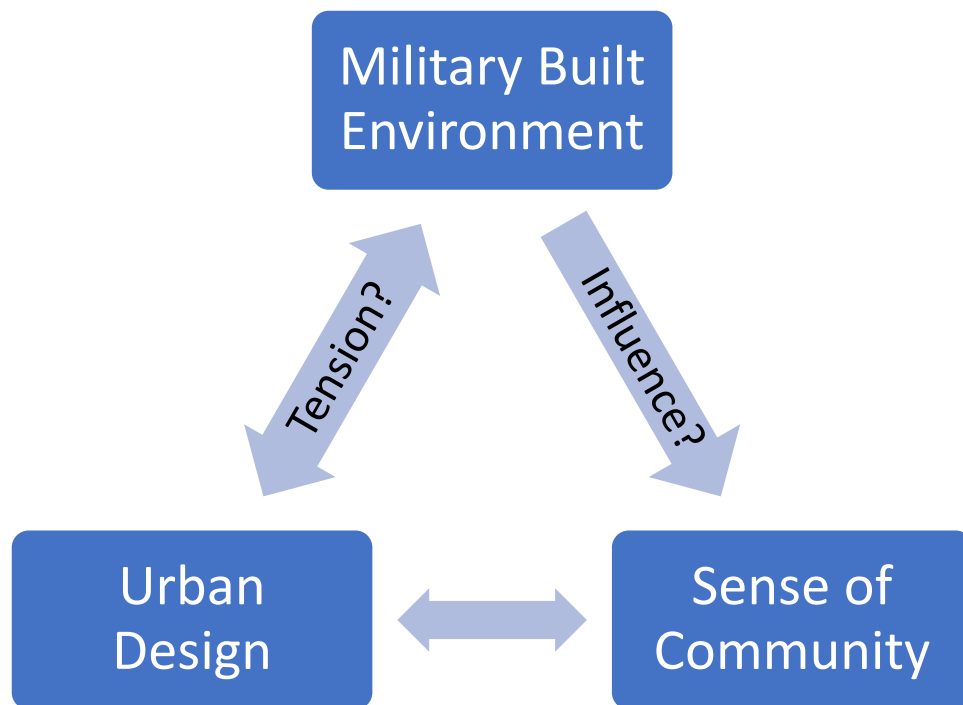


Figure 2: Diagram of Conceptual Relationship Between Elements of Research Topic

1. What spatial and functional land use patterns define Naval Station Bremerton, and how do they compare to civilian urban design principles?
2. What potential is there for incorporating civilian urban design principles into naval base planning?

By answering these questions, this research will highlight spatial constraints and opportunities in military land use policies, identifying areas where civilian urban planning strategies could inform future base design to improve service members' quality of life.

1.3 Research Approach

This study employs a document-based and comparative research approach, combining spatial analysis with an in-depth comparison of military planning policies and urban design principles. The methodology consists of three key components:

1. *Military Guidelines Analysis* – A systematic review of military planning frameworks, including the Unified Facilities Criteria (UFC) planning guidance and Department of Defense (DoD) land use policies. This analysis identifies regulatory constraints and planning directives that shape military base design.
2. *Design Principles Analysis* – A review and comparison of common civilian urban design approaches, including Seattle's Urban Village model, New Urbanism, Crime Prevention Through Environmental Design, and Complete Streets, focusing on design principles such as mixed-use development, pedestrian accessibility, and public space integration.
3. *Systematic comparison of the Military Guidelines analysis and the Design Principles analysis*, with a focus on areas of opportunity and tension.
4. *Naval Base Site Analysis* – Mapping of existing land uses within the base to visualize spatial organization, functional zoning, and accessibility. This component highlights potential opportunities and barriers to integrating contemporary urban design principles within military installations.

Naval Station Bremerton (part of Naval Base Kitsap in Washington State) offers a clear illustration of how naval installations structure and regulate land use. Like many Navy bases, it is

compartmentalized by functions, including administration, waterfront operations, industrial maintenance, residential and recreational areas, with each governed by security requirements and operational priorities (Department of Defense, 2012). The layout of this base embodies the typical typology of a Navy installation, where mission-critical zones (dry docks, piers, ship maintenance facilities, etc.) often occupy prime waterfront property, and residential or community-support facilities lie in more peripheral locations. These zones must comply with Unified Facilities Criteria (UFC) guidelines that dictate everything from building setbacks and access control to the organization of housing clusters and industrial sites (Department of Defense, 2018).

Bremerton is especially relevant as a research case study because it is a highly active naval center that supports various fleet operations and is a major employer in the Puget Sound region, thus stimulating frequent civilian-military interaction. The base's location within an urbanized context mirrors conditions at other Navy installations nationwide, where military missions intersect with surrounding municipalities and shared infrastructure. By focusing on how land use is formally determined and regulated within Naval Station Bremerton, this research captures the core tensions of Navy base planning: security mandates, mission efficiency, and the need to retain an increasingly professional workforce and their families (Lachman, Resetar, and Camm, 2016). Bremerton's variety of functional zones, from submarine berths to family housing, enables an in-depth look at land use decisions and how they align or diverge from contemporary urban planning principles such as walkability, mixed-use development, and connectivity.

Other regional installations such as Joint Base Lewis-McChord (JBLM) and Naval Station Everett operate within similar contexts, highlighting broader trends in military land use

planning. By examining Bremerton's spatial dynamics, this research contributes to a growing discourse on how active military installations function as part of larger urban systems rather than isolated entities.

1.4 Document Structure

This thesis is organized into six chapters. Chapter 1 introduces the research context, outlines the primary and supporting research questions, and discusses the research approach. It also highlights the unique characteristics of the Puget Sound Region in relation to a naval base and summarizes the study's contributions and structure. Chapter 2 details the research methods, including document analysis, comparative analysis, and spatial mapping techniques. Chapter 3 provides a design principles analysis with a literature review of key theories and prior research on urban design, military land use planning, and base-community interactions.

Chapter 4 presents a site analysis and Chapter 5 provides a discussion of Naval Station Bremerton as a case study, analyzing its land use structure and identifying points of alignment and tension with civilian urban planning principles. These chapters provide the findings and broader discussion along with conclusions, respectively.

Chapter 2 Research Methods

This study compared the land use patterns of Naval Station Bremerton to contemporary urban planning principles by conducting document analysis, literature review, and visual interpretation of publicly available base maps and satellite imagery. The methods allowed for a systematic examination of military land use planning frameworks, base spatial organization, and potential areas of alignment or divergence with urban planning practices. The research design includes the review of military planning guidelines and civilian urban planning policies, the examination of relevant urban design theories and case studies, the observation of spatial patterns and land use characteristics, and comparisons between military and civilian land use approaches.

2.1 Research Design and Approach

This study takes a qualitative and comparative approach, using document and spatial analysis techniques to understand land use at Naval Station Bremerton. To support this interpretative approach, it is based on the foundations of grounded theory, building off textual data (such as document analysis) to compensate for data collection challenges (Chun et al, 2019).

The research is structured to:

- Identify planning principles governing military bases and compare them to civilian urban design frameworks.
- Assess spatial organization within the base through visual interpretation of publicly available maps.
- Evaluate potential integration or separation between military and civilian land use based on planning policies and spatial characteristics.

Since military installations follow unique land use regulations due to security and operational constraints, this research does not aim to propose redesigns but instead explores where existing policies either allow or restrict alignment with accepted urban planning practices.

2.2 Design Principles Analysis

A major component of this research is the analysis of military land use planning framework documents. By systematically examining these guiding documents, the study identifies how land use is organized within Naval Station Bremerton and how these practices compare to select civilian urban planning principles.

2.2.1 Military Planning Documents

The following military documents constitute the core set used for analysis:

1. Unified Facilities Criteria (UFC) Planning Guidelines: The guidelines govern the design, construction, and maintenance of facilities with the Department of Defense. They specify the zoning practices, security perimeters, building codes, and antiterrorism measures that directly shape the land use and development within DoD installations. They consist of many manuals, with this study focusing on three specific manuals.
2. Department of Defense (DoD) Land Use Policies: These are broader DoD directives and instructions to define the overarching principles of how space is allocated for missions, housing, recreation, and administrative functions. These policies often reflect security, readiness, and quality-of-life considerations and provide a baseline for each installation's specific approach.

Examining these documents provides insight into the internal logic of base land use and how policies may enable or restrict urban integration. These documents highlight constraints—such as mandated setbacks—that create tension with urban design principles, while also revealing opportunities for elements like mixed-use development. By comparing military planning frameworks to civilian urban design policies, this research identifies key parallels and divergences, assessing where military standards align with or depart from contemporary planning practices. This approach clarifies the degree of flexibility within military land use regulations and evaluates their capacity to incorporate urban design principles commonly found in civilian contexts.

2.2.2 Identifying Civilian Urban Planning Policies for Comparison

To contextualize the land use framework of Naval Station Bremerton within broader urban design and planning principles, this research uses civilian urban planning policies as a comparative reference. The key sources examined include:

1. **Urban Design Principles:** Urban design elements such as land use diversity, connectivity, public space, transit & mobility, hierarchy of spaces, legibility, infrastructure efficiency, security & safety, and cultural/institutional identity were examined within several urban design approaches. These approaches consisted of Kevin Lynch (*Image of the City*), Defensive Space/CPTED, Placemaking, Transit-Oriented Development, New Urbanism, and Complete Streets. These concepts, as outlined in sources such as books, journal articles, and planning guidelines, introduce principle definitions and the various ways different approaches may implement them.
2. **Military Base Redevelopment Case Studies:** Examining case studies of decommissioned or repurposed military installations provides insight into how former bases have

transitioned into civilian-oriented urban spaces. While active installations have distinct operational and security constraints, these cases offer valuable lessons on integrating urban design principles and optimizing land use.

2.3 Comparison Through Literature Review

The literature review serves as a primary methodological tool, both as a source of secondary data and as a framework for analyzing military and civilian land use policies. This study adopts a comparative approach, systematically reviewing military planning documents, such as the Unified Facilities Criteria, alongside civilian urban planning frameworks, including New Urbanism and Complete Streets. By identifying areas of convergence and divergence, the literature provides a foundation for evaluating land use at Naval Station Bremerton within broader urban and military planning paradigms. This structured review informs the study's analysis of spatial organization, regulatory constraints, and opportunities for integration, ensuring the research is grounded in existing scholarship while offering a basis for assessing real-world policy applications. The literature review is organized around the following core themes:

1. **Military Base Land Use Research:** Examining prior studies on base planning, security-driven zoning, and spatial organization within military environments. Identify common challenges in base land use, such as restricted access and single-use zoning. Reviewing military land use planning documents such as the Unified Facilities Criteria (UFC) and Department of Defense (DoD) land use policies.
2. **Comparative Studies of Urban and Military Land Use Frameworks:** Analyzing how military installations function as urban entities, despite being governed by security and

operational constraints. Comparing civilian zoning practices with military spatial planning, focusing on opportunities for alignment and divergence.

Because military installations restrict certain spatial data for security reasons and often use separate GIS systems from local planning agencies, direct GIS analysis is limited. However, this level of data is not essential for the study's qualitative spatial analysis. Instead, the literature review draws on previous spatial studies of military bases and urban planning models to inform interpretations of land use patterns and spatial organization. Existing studies on military land use helped to inform these methods and highlight gaps in methodology. Some of the previous studies explored in the literature review showcase military bases that were analyzed through urban design principles and the use of spatial decision-making methods, like the comparisons made in this study; studies have used visual analysis of military areas to evaluate walkability, barriers, and integration challenges. While many studies have focused on base redevelopment, they clearly indicate that there is a lack of comparative research on active military installations (Balletto et al, 2022; Ashley, 2016).

2.4 Site Analysis

By analyzing the spatial organization, connectivity, allocation of public space, and mobility strategies of Naval Station Bremerton in relation to accepted principles of urban design and planning, I present areas of divergence, alignment, and/or potential adaptation. Due to security restrictions, direct GIS data for military installations is not publicly available, making traditional spatial analysis unfeasible for this study. While digitizing aerial imagery was an option, this approach was not pursued because there was no need for detailed geospatial analysis, as the focus was on qualitative spatial characteristics. Instead, a visual interpretation method was

employed to analyze spatial characteristics at Naval Station Bremerton. Using publicly available satellite images, base planning maps, and municipal land use data, I examined on-base spatial patterns, land use organization, connectivity, and potential barriers to integration. The goal of this approach is to assess how the installation's land use and physical layout align or diverge from broader urban planning frameworks, particularly regarding land use structure, accessibility, and interaction with adjacent civilian areas.

2.4.1 Analytical Process

Comparing Spatial Organization

The site analysis was then used to create diagrams and conceptual sketches to better visualize key spatial characteristics of the base, including land use, connectivity patterns, and contrasts between base planning and urban design practices. These visualizations serve as a supporting tool in the discussion of land use challenges, spatial relationships, and how military land use planning aligns or diverges from urban development principles

2.5 Comparative Framework for Findings

To evaluate approaches to military and civilian land use, this study employs a comparative framework based on key urban design criteria. Military installations, including Naval Station Bremerton, are governed by Department of Defense (DoD) land use regulations and Unified Facilities Criteria (UFC) guidelines, which prioritize operational efficiency, security, and controlled access over traditional urban planning objectives such as mixed-use development, pedestrian connectivity, and transit accessibility. In contrast, cities traditionally follow municipal zoning codes, comprehensive planning policies, and urban design principles that promote walkability, mixed land use, and public space integration. By comparing these two different yet

adjacent planning paradigms, this study explores the applicability of selected civilian urban planning strategies within the regulatory and security constraints of a naval installation.

2.6 Limitations of Methodology

While this research provides valuable insights into military and civilian land use comparisons, certain methodological limitations must be acknowledged. These constraints stem primarily from data accessibility, methodological scope, and the nature of available sources. Despite these challenges, the research maintains validity through triangulation of document analysis, literature review, and visual interpretation.

2.6.1 Restricted Access to Military Documents

Military installations operate under strict security and operational confidentiality protocols, which limit the availability of certain planning documents, infrastructure maps, and internal reports. While this study examines publicly available DoD planning policies and UFC guidelines, specific Naval Station Bremerton Master Plan documents or detailed zoning maps were not made available to me. As a result, I relied on visual observations and secondary sources to make interpretations about base land use. This limitation affects the ability to verify site-specific decision-making processes but does not preclude meaningful comparisons with broader military and civilian land use policies.

Despite these limitations in methodology which presented challenges in researching the topic of this study, the combination of qualitative spatial analysis with policy evaluation presents a comprehensive assessment of Naval Station Bremerton's land use framework. While future studies might incorporate GIS, field observations, or interview-based methodologies, this approach still provides a valuable foundation for understanding the interactions between military installations and civilian urban planning.

Chapter 3 Design Principles Analysis

This chapter reviews key literature on urban design, military base land use planning, and the spatial organization of installations. The spatial organization of military installations has drawn increasing attention from policymakers, planners, and academics, particularly regarding how bases interact with or remain isolated from surrounding civilian communities (Ashley and Touchton, 2016; Casserly, 2011). Naval Station Bremerton, like many other U.S. installations, follows land use policies shaped by operational readiness, security, and historical legacies. These factors often do not align neatly with contemporary urban design principles, such as mixed-use development, walkability, and community integration (Bagaen, 2006; Cozens and Love, 2015).

Literature on military land use has historically emphasized two primary areas: base closure and redevelopment (Abrahams, 2008; Bradshaw, 1999) and compatibility planning to mitigate base-civilian conflicts (Cowan, 2012; Spectrum Group, 2016). More recent studies highlight the need to examine active installations as evolving urban entities (Balletto et al, 2022; Light, 2004). The literature informs the study's comparative framework by examining how military and civilian planning principles align and diverge, particularly regarding zoning, mobility, connectivity, and public space design. The chapter is structured around the following themes:

1. Theoretical Foundations of Urban Design and Spatial Planning
2. Military Land Use Planning Frameworks
3. Connectivity and Mobility within Military Installations
4. Security-Driven Planning and Design Considerations

3.1 Theoretical Foundations of Urban Design and Spatial Planning

Foundational works in urban design and spatial planning provide critical insights into how spatial organization influences movement, accessibility, and land use efficiency. For this study, the emphasis is on principles that can be physically observed and measured through site analysis, mapping, and spatial imagery, rather than abstract social interactions. Urban design models such as New Urbanism, Complete Streets, and Crime Prevention Through Environmental Design (CPTED) provide a practical framework for analyzing land use efficiency, connectivity, and security. New Urbanism emphasizes measurable characteristics such as block size, density, and land use diversity. Complete Streets principles focus on observable infrastructure, including pedestrian pathways, street networks, and multimodal access. CPTED provides a lens for assessing physical security elements, such as sightlines, fencing, and controlled access points. Military bases, however, are shaped by security-driven planning, which imposes different constraints on spatial organization.

Scholars have examined the fundamental tension between military and civilian planning approaches (Bagaeen, 2006; Cozens & Love, 2015). While civilian urban design prioritizes human-centered, mixed-use environments that promote engagement and mobility, military installations are designed for efficiency, security, and spatial isolation. This divergence raises important questions about whether and how urban design principles can be adapted to improve military land use strategies while maintaining security imperatives.

The Urban Design Principles Matrix (Table 1) provides a structured framework for analyzing key urban design elements and how they align or conflict with military land use and security planning. This analysis identifies the potential application of urban design strategies within military installations, particularly in balancing connectivity, security, mobility, and public space design. The table summarizes and compares six major urban design approaches—Kevin

Lynch's spatial theory, Defensive Space/CPTED, Complete Streets, Placemaking, Transit-Oriented Development (TOD), and New Urbanism—to assess their relevance to land use planning within military and civilian contexts.

This study specifically focuses on design elements that can be analyzed through spatial assessment and planning principles, rather than those reliant on subjective or behavioral analysis. The selected principles—land use diversity, connectivity, public space, transit & mobility, hierarchy of spaces, legibility, infrastructure efficiency, security & safety, and cultural identity—are all quantifiable and observable through mapping, spatial analysis, and document review.

Table 1: Urban Design Principles Matrix

| Urban Design Principles Matrix | | | | | | | |
|--------------------------------|--|---|--|---|--|---|--|
| Design Elements | Element Definition | Kevin Lynch | Defensive Space / CPTED | Complete Streets | Placemaking | Transit-Oriented Development | New Urbanism |
| Land Use Diversity | Presence of residential, commercial, and civic functions in the same area | Medium - Defines mixed districts but not land use strategies | Weak - Prefers single-use zoning | Medium - Encourages diverse transit-friendly uses | Strong - mixed-use public spaces | Strong - Integrates transit with land use | Strong - Focus on walkable, mixed-use neighborhoods |
| Connectivity | Degree to which streets, paths, and transit link destinations efficiently | Strong - Defines paths, nodes, edges for movement | Weak - Perimeter controls limit free movement | Strong - Focus on multimodal network | Medium - Emphasizes social connectivity | Strong - Transit networks centralize access | Strong - Walkability and grid patterns enhance movement |
| Public Space | Quality and availability of parks, plazas, and gathering spaces | Strong - Nodes and districts create activity centers | Weak - Reduces public gathering | Medium - Supports sidewalk activation | Strong - Core focus | Medium - Transit hubs are informal gathering areas | Strong - Walkable streets support social spaces |
| Transit & Mobility | Accessibility of multimodal transport, walkability, and car dependency | Medium - Supports connectivity but not transit-specific | Weak - Private car reliance | Strong - Focus on pedestrian/bike/transit balance | Medium - Ensures access to community spaces | Strong - Integrates transit hubs as focal points | Strong - Reduced car dependency |
| Hierarchy of Spaces | Distinct zoning of different functional areas (public, semi-public, private) | Medium - Organizes spaces but not strict zoning | Strong - Mandates clear separations | Medium - Prioritizes public access but has zoning layers | Medium - Encourages soft transitions | Medium - Transit zones with land use layering | Strong - Clear public-private distinctions |

| | | | | | | | |
|---|--|--|---|--|---|---|---|
| Legibility | Clear wayfinding through nodes, edges, landmarks, paths, and districts | Strong - Legibility is the foundation of urban experience | Weak - Security barriers and gates reduce intuitive navigation | Medium - Streetscape design improves readability | Strong - Public art & landmarks define space | Medium - Transit stations act as major nodes | Medium - Grid networks are clear layouts |
| Infrastructure Efficiency | Degree to which the site can function independently in terms of power, water, food, and emergency response | Weak - Not addressed | Strong - Core focus | Medium - Prioritizes infrastructure for multimodal access | Weak - Dependent on existing infrastructure | Medium - Relies on municipal services | Medium - Encourages district sustainability but not self-sufficiency |
| Security & Safety | Crime and violence prevention through design, surveillance, and access control | Weak - Not a focus | Strong - Core focus | Medium - Design enhances passive security | Medium - Encourages social safety through engagement | Medium - Transit stations require enhanced safety design | Medium - Active street life increases natural surveillance |
| Cultural/ Institutional Identity | Presence of regionally influenced design and community-building efforts | Strong - Landmarks and districts create cultural identity | Weak - Security-focused spaces limit integration | Medium - Supports local contextual urbanism | Strong - Fosters unique cultural expression | Medium - Adapts to cultural context where possible | Strong - Local architectural and planning traditions |

Table 2: Urban Design Principles Heatmap

| Urban Design Principles Matrix Heatmap | | | | | | | |
|--|--|-------------|-------------------------|------------------|-------------|------------------------------|--------------|
| Design Elements | Element Definition | Kevin Lynch | Defensive Space / CPTED | Complete Streets | Placemaking | Transit-Oriented Development | New Urbanism |
| Land Use Diversity | Presence of residential, commercial, and civic functions in the same area | Medium | Weak | Medium | Strong | Strong | Strong |
| Connectivity | Degree to which streets, paths, and transit link destinations efficiently | Strong | Weak | Strong | Medium | Strong | Strong |
| Public Space | Quality and availability of parks, plazas, and gathering spaces | Strong | Weak | Medium | Strong | Medium | Strong |
| Transit & Mobility | Accessibility of multimodal transport, walkability, and car dependency | Medium | Weak | Strong | Medium | Strong | Strong |
| Hierarchy of Spaces | Distinct zoning of different functional areas (public, semi-public, private) | Medium | Strong | Medium | Medium | Medium | Strong |
| Legibility | Clear wayfinding through nodes, edges, landmarks, paths, and districts | Strong | Weak | Medium | Strong | Medium | Medium |
| Infrastructure Efficiency | Degree to which the site can function independently in terms of power, water, food, and emergency response | Weak | Strong | Medium | Weak | Medium | Medium |
| Security & Safety | Crime and violence prevention through design, surveillance, and access control | Weak | Strong | Medium | Medium | Medium | Medium |
| Cultural/Institutional Identity | Presence of regionally influenced design and community-building efforts | Strong | Weak | Medium | Strong | Medium | Strong |

The Urban Design Principles Matrix Heatmap (Table 2) provides a visual reference for quickly identifying the strengths and weaknesses of different urban design approaches in relation to key design elements. By using a color-coded system, the heatmap allows for immediate comparison of where principles strongly align (green) or are not a focus (red) related to urban design goals.

Green-shaded areas indicate strong alignment, where a particular design principle effectively supports the given design element. For example, New Urbanism and Transit-Oriented Development (TOD) show strong support for connectivity, public space, and mixed-use land development. Red-shaded areas highlight weak alignment, where an approach may conflict with or fail to address a key design element. Notably, Defensive Space/CPTED tends to score weakly in areas such as connectivity and public space, emphasizing security over accessibility.

3.1.1 Urban Fabric and Connectivity

The interplay between land use diversity, connectivity, and urban vitality is a cornerstone of Jane Jacobs's *The Death and Life of Great American Cities* (1961). Jacobs critiques rigid zoning policies that enforce monofunctional land uses, arguing instead for mixed-use neighborhoods with fine-grained connectivity and human-scale environments. Military bases, by contrast, typically adhere to single-use zoning, where administrative, residential, and operational functions are spatially segregated, reducing opportunities for interaction and accessibility. The Complete Streets movement and New Urbanism principles advocate for walkable environments with multimodal connectivity, reinforcing Jacobs' ideas (Congress for the New Urbanism, 2001). These contemporary urban design frameworks call for balanced land use that accommodates pedestrians, cyclists, and transit users, principles that military installations often struggle to incorporate due to force protection requirements and sprawling layouts.

3.1.2 Walkability and Public Spaces

A critical theme in contemporary urban design is walkability—the extent to which an environment supports pedestrian movement, access to amenities, and community interaction (Forsyth, 2015; Speck, 2018). The concept of walkability varies depending on context and priorities (Forsyth, 2015). Some scholars emphasize environmental features such as compact, traversable areas with engaging streetscapes, while others highlight walkability's role in fostering vibrant communities and sustainable transportation options. Forsyth (2015) argues that definitions of walkability often lead to conflicting urban design goals, making it necessary to clarify how military installations, like Naval Station Bremerton, can balance functional efficiency with pedestrian accessibility. Speck (2018) expands on the practical steps needed to

create walkable environments, arguing that most U.S. cities, and by extension, military bases, fail to implement necessary changes due to auto-centric policies and overemphasis on parking and security setbacks. His work provides a guideline for improving pedestrian infrastructure, focusing on removing unnecessary parking, incorporating visually engaging streetscapes, and ensuring a mix of land uses. Figure 3 illustrates a spatial analysis of pedestrian accessibility on the Murray State University campus, using 5- and 10-

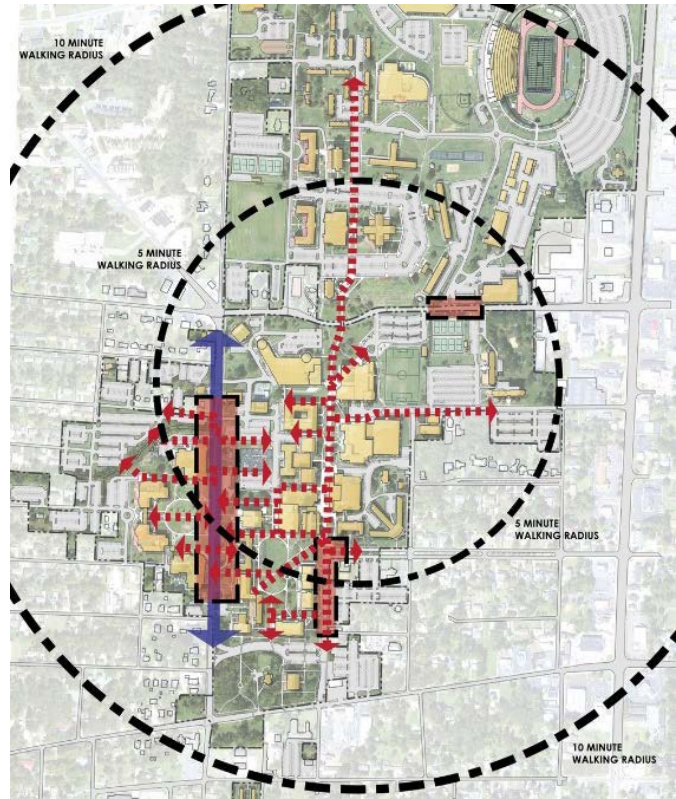


Figure 3: Murray State University Campus Planning with 5-, 10-minute Walking Circles. From: Element Design. <http://www.element-site.com/master-planning>

minute walking radii to assess connectivity and movement patterns. This visualization method is relevant to this study as it demonstrates a way to analyze internal base circulation and walkability, similar to how pedestrian accessibility can be assessed within Naval Station Bremerton.

Studies have shown that a combination of land use diversity, intersection density, and proximity to essential destinations has the most significant effect on whether people choose to walk (Ewing and Cervero, 2010). Simply having sidewalks is insufficient if there are no meaningful destinations within walking distance. Military installations, for example, often fail to meet typical walkability metrics due to gated perimeters, single-use enclaves, and auto-centric layouts. Scholars highlight the potential benefits of introducing elements like crime prevention

through environmental design (CPTED) or narrower roadway widths to enhance safety and connectivity (Cozens and Love, 2015; Karim, 2015). While military planning prioritizes functional separation and security, emerging research suggests that certain adaptations could enhance walkability and connectivity without compromising safety (Barry-Jester, 2017).

3.1.3 Crime Prevention Through Environmental Design (CPTED)

Crime Prevention Through Environmental Design (CPTED) is a concept that emphasizes designing the built environment to naturally reinforce safety and security. Originally developed by Oscar Newman, CPTED is based on the hierarchy of space principle, where intermediate spaces serve as transitional zones between public and private areas,

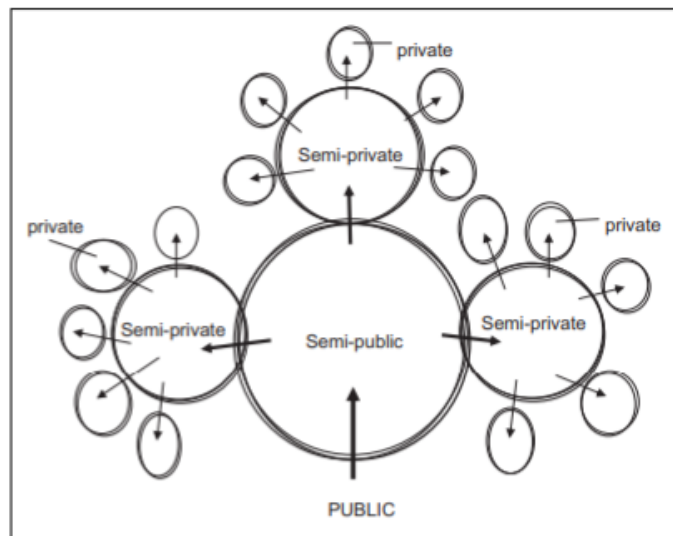


Figure 4: Hierarchy of Space with Arrows Delineating Movement Between Space. From *Defensible Space*.

fostering surveillance and controlled access. By strategically designing physical spaces, CPTED is supposed to enhance security, crime deterrence, and urban livability. CPTED principles are directly referenced in UFC 2-100-01 *Installation Master Planning*, where they are noted as a key element of defensible planning for military installations. Figure 4 provides a visual example of the concepts found in CPTED. The three primary security strategies emphasized in CPTED are Natural Surveillance, Territorial Reinforcement, and Natural Access Control. Natural Surveillance is the concept of ensuring visibility and passive observation by encouraging active public spaces and strategically designing lighting, windows, and pedestrian routes. High-activity areas, such as street-level retail and community spaces, can be placed next to low-use zones to

increase informal surveillance and deter crime (Cozens and Love, 2015). Territorial Reinforcement is described as using landscaping, signage, and architectural elements to create a sense of ownership and delineate boundaries between public, semi-public, and private spaces. Natural Access Control involves structuring the built environment to channel movement, prevent unauthorized access, and create safer pathways, reducing the need for overt security measures. These principles can be particularly useful in military installations where security must be balanced with usability and urban integration. For example, military bases, by design, prioritize functional separation and restricted access, which can result in underutilized spaces, dead zones, and limited surveillance opportunities. In fact, CPTED principles are directly referenced in UFC 2-100-01 *Installation Master Planning*, where they are noted as a key element of defensible planning for military installations. However, while CPTED is widely applied in urban planning and crime prevention, its potential in military installation planning remains underexplored.

3.2 Military Land Use Planning Frameworks

Military bases operate under distinct planning guidelines shaped by security concerns, operational efficiency, and mandates for the protection of personnel. Frameworks, such as the Unified Facilities Criteria (UFC) and Department of Defense (DoD) Planning Standards, dictate spatial organization within military installations. Other key sources for understanding military base contexts are studies related to the redevelopment and closure of installations. This literature establishes the regulatory context within which Naval Station Bremerton's land use structure must be analyzed. The highest guidance for planners within the DoD is the UFC 2-100-01 *Installation Master Planning* (comprised of ten planning strategy components) which suggests that planning strategies related to Sustainable Planning, Healthy Community Planning, and Defensible Planning are fundamental considerations in base planning decisions. Sustainable

planning components tend to have the most significant effects on planning within the built environment of an installation, one of those components being compact development. The UFC describes this as a mixed-use development that encourages active transportation through higher densities and integrated street networks but includes "...minimal spacing between buildings while maintaining considerations of AT requirements..." (DoD, 2012). Mixed-use is categorized as horizontal and vertical mixed-uses, with horizontal referring to multiple buildings and vertical applying to a single facility. Horizontal mixed-use promotes a "campus" style of development with compatible uses combined into areas that are within a 10-minute walking radius. Vertical mixed-use also focuses on combining compatible uses, but within a single building, which proves difficult to implement on a military base due to funding for each tenant often coming from different sources.

Other key components captured in the UFC that directly impact building footprints and land use are components related to multi-story construction, building orientation/configuration, and connected transportation. These components contribute to urban design principles related to walkability and connectivity, intending to reduce buffer zones for AT/FP by combining uses within fewer buildings, each of which requires a standoff distance. Strategies for integrated walkways and bikeways and multi-modal requirements for roads appear very similar to complete streets concepts (although not explicitly named as such) and go as far as to emphasize the avoidance of cul-de-sacs and to integrate access gates into the larger network (DoD, 2012; Fenner, 2019). The Military Planning Guidelines Matrix (Table 3) provides a structured comparison of three key military planning frameworks—Unified Facilities Criteria (UFC), Anti-Terrorism/Force Protection (AT/FP) Guidelines, and the Healthy Base Initiative (HBI)—in relation to major urban design and land use principles. This matrix helps identify areas of

alignment and areas that are not addressed or conflicts between design elements and military guidelines.

The Military Planning Guidelines Heatmap (Table 4) provides a visual representation of strengths and weaknesses across key planning elements, allowing for a quick comparison of where UFC, AT/FP, and HBI frameworks align with urban design priorities. Green (Strong) represents areas where a framework fully supports an urban design principle. Security and infrastructure efficiency rank high across all military planning approaches. Red (Weak) highlights areas where a planning framework has limited integration of these design elements. AT/FP consistently ranks low in connectivity, transit access, and public space, indicating a strong security-first approach. By visualizing these relationships, the heatmap quickly identifies where adjustments in military land use strategies could enhance livability and design.

Table 3: Military Planning Guidelines Matrix

| Military Planning Guidelines Matrix | | | | |
|-------------------------------------|--|---|---|--|
| Design Elements | Element Definition | Unified Facilities Criteria (UFC) | Anti-Terrorism/Force Protection (AT/FP) Guidelines | Healthy Base Initiative |
| Land Use Diversity | Presence of residential, commercial, and civic functions in the same area | Medium - Bases are functionally zoned but some areas mix uses | Weak - Functionally separated for security reasons | Medium - Promotes active and walkable mixed-use environments |
| Connectivity | Degree to which streets, paths, and transit link destinations efficiently | Medium - Internal networks planned, but external integration is weak | Weak - Prioritizes security over connectivity | Strong - Encourages pedestrian-friendly and bikeable infrastructure |
| Public Space | Quality and availability of parks, plazas, and gathering spaces | Medium - Some bases have designated recreational spaces | Weak - Public gathering discouraged in sensitive areas | Strong - Promotes accessible and engaging public spaces for health and wellness |
| Transit & Mobility | Accessibility of multimodal transport, walkability, and car dependency | Weak - Private vehicle dependency is high | Weak - Security concerns limit transit accessibility | Strong - Supports active transportation modes (walking, biking) |
| Hierarchy of Spaces | Distinct zoning of different functional areas (public, semi-public, private) | Strong - Bases have strict hierarchical zoning | Strong - Security zones enforce rigid separation | Medium - Encourages accessibility between functional areas to support movement and activity |
| Legibility | Clear wayfinding through nodes, edges, landmarks, paths, and districts | Medium - Follow structured layouts but are not always intuitive | Weak - Security barriers limit visual and navigational clarity | Strong - Supports clear signage and intuitive layouts |

| | | | | |
|--|--|---|--|---|
| Infrastructure Efficiency | Degree to which the site can function independently in terms of power, water, food, and emergency response | Strong - Self-sufficient energy, water, and emergency systems | Strong - Security requires redundant infrastructure | Medium - Encourages green and resilient infrastructure for health and sustainability |
| Security & Safety | Crime and violence prevention through design, surveillance, and access control | Strong - Core focus | Strong - Built for maximum security and controlled access | Strong - Encourages safety measures that promote physical activity and social cohesion |
| Cultural/Institutional Identity | Presence of regionally influenced design and community-building efforts | Medium - Bases reflect national identity but not local culture | Weak - Prioritizes security over cultural integration | Medium - Incorporates cultural and wellness elements into base planning |

Table 4: Military Planning Guidelines Heatmap

| Military Planning Guidelines Matrix | | | | |
|--|--|-----------------------------------|--|-------------------------|
| Design Elements | Element Definition | Unified Facilities Criteria (UFC) | Anti-Terrorism/Force Protection (AT/FP) Guidelines | Healthy Base Initiative |
| Land Use Diversity | Presence of residential, commercial, and civic functions in the same area | Medium | Weak | Medium |
| Connectivity | Degree to which streets, paths, and transit link destinations efficiently | Medium | Weak | Strong |
| Public Space | Quality and availability of parks, plazas, and gathering spaces | Medium | Weak | Strong |
| Transit & Mobility | Accessibility of multimodal transport, walkability, and car dependency | Weak | Weak | Strong |
| Hierarchy of Spaces | Distinct zoning of different functional areas (public, semi-public, private) | Strong | Strong | Medium |
| Legibility | Clear wayfinding through nodes, edges, landmarks, paths, and districts | Medium | Weak | Strong |
| Infrastructure Efficiency | Degree to which the site can function independently in terms of power, water, food, and emergency response | Strong | Strong | Medium |
| Security & Safety | Crime and violence prevention through design, surveillance, and access control | Strong | Strong | Strong |
| Cultural/Institutional Identity | Presence of regionally influenced design and community-building efforts | Medium | Weak | Medium |

Military land use planning is shaped by a series of Unified Facilities Criteria that dictate installation master planning, security requirements, and spatial organization. While some UFCs promote compact, walkable development, others prioritize force protection and defensive design, often limiting the implementation of urban design principles. One of the most comprehensive planning documents, UFC 2-100-01 *Installation Master Planning*, calls for compact development, multimodal transportation, and sustainable land use (DoD, 2012). The guidance suggests integrating mixed-use planning and pedestrian-friendly infrastructure to support base livability. However, implementation is often constrained by security-focused UFCs, such as UFC 4-010-01 *DoD Minimum Antiterrorism Standards for Buildings* and UFC 4-020-01 *Security Engineering Facilities Planning Manual*. These standards emphasize standoff distances, blast-resistant design, and restricted access, which discourage compact, pedestrian-friendly layouts in favor of auto-dominated, low-density spatial arrangements (DoD, 2018; DoD, 2020). The contrast between these planning approaches creates a fundamental tension in military base design with *Installation Master Planning* encouraging connectivity and compact development, but security-driven UFCs require perimeter hardening, setbacks, and controlled access zones, which often result in fragmented land use and restricted mobility.

This conflict is evident in the Healthy Base Initiative (HBI), launched by the DoD in 2014 under Operation Live Well, which sought to promote active living through better pedestrian infrastructure and access to amenities (Healthy Base Initiative: Executive Summary, 2014). HBI's findings confirmed that military installations were overwhelmingly designed for the automobile and that base amenities (such as food, fitness, and recreation facilities) were often poorly located for pedestrian access. The initiative also highlighted the lack of funding for

pedestrian and bike-friendly projects, reinforcing the reality that quality-of-life improvements often take a backseat to security mandates in DoD planning.

In practice, these competing frameworks shape the physical layout of military bases, affecting connectivity, mobility, and overall livability. While planning guidance calls for compact, sustainable development, security regulations continue to enforce low-density, auto-centric designs. This regulatory paradox underscores the difficulty of applying urban planning best practices within the context of military installations, where operational needs and force protection often override principles of mixed-use development and pedestrian accessibility.

There are also inherent tensions between urban planning principles and anti-terrorism design requirements. While walkability and mixed-use principles are increasingly recognized within DoD planning documents, personnel protection constraints often override these efforts. *Installation Master Planning* emphasizes sustainable planning and pedestrian-oriented infrastructure, yet bases remain heavily vehicle-dependent due to security-driven spatial layouts (Fenner, 2019). Anti-terrorism guidelines enforce significant standoff distances, building separation, and clear zones, which reduce opportunities for compact, walkable base environments (DoD, 2018). Yet there are opportunities for alignment between these security and master planning guidance documents that are mutually supportive. Studies by Barry-Jester (2017) show how security measures can be seamlessly integrated into the built environment through landscape barriers, fortified street furniture, and controlled pedestrian pathways, offering potential adaptation strategies for military installations.

3.3 Security-Driven Planning and Design Considerations

Military installations have historically been designed with security, mission efficiency, and controlled access as primary considerations. Unlike civilian urban environments, where

planning often prioritizes mixed-use development, pedestrian connectivity, and public space integration, military bases follow rigid spatial segregation and zoning principles to maintain security and operational readiness. The Unified Facilities Criteria (UFC) provides the regulatory framework that dictates these land use decisions, establishing minimum antiterrorism standards that impact site layouts, setbacks, and public accessibility (Department of Defense, 2018). The *Installation Master Planning* UFC speaks to the issue of security generically, with the *Minimum Anti-terrorism Standards* UFC speaking more directly to engineering considerations, and the *Security Engineering Facilities Planning Manual* as a hybrid of the two previous UFCs. The UFC clearly states that “military installations must be safe and secure in order to operate effectively and efficiently” and has deliberately bound the multiple UFCs together by creating requirements for installations such as “the master plan must incorporate UFC 4-010-01...”. While these measures are necessary to protect military personnel and assets, they often result in single-use zoning, large security buffers, and limited interaction between on-base and off-base communities (Barry-Jester, 2017).

Anti-terrorism and force protection (AT/FP) guidelines are not merely suggestions, they are requirements as outlined through multiple UFCs. An added layer of complexity is understanding the intended audiences for each UFC and how this leads to a lack of alignment between security-focused professionals and installation planning teams. For example, UFC 2-100-01 *Installation Master Planning* is intended for use by installation planners, thus it provides more direct language and guidance on requirements for concepts such as walkability. Yet, UFC 4-010-01 *DoD Minimum Antiterrorism Standards for Buildings* is intended for guiding engineers and security professionals in building a comprehensive defense through baseline measures with the goal being to “reduce collateral damage and the scope and severity of mass casualties in the

event of a terrorist attack” (DoD, 2018; Fenner, 2019). Considerable built environment decisions and accepted criteria for security fall outside the control of installation planners with the UFC establishing the responsibility of the Antiterrorism Officer (ATO) as the individual that creates the Design Basis Threat (DBT). This DBT is installation-specific and calls out the specific threats to that installation to be designed against when planning or completing facility design. Specific to planning, the UFC calls out, “The DBT may drive consolidation of parking areas, parking garages, pedestrian-only areas, and the consolidation or dispersal of critical assets” which creates greater implications for the coordination of security and quality-of-life strategies between the different professionals (planners and security officers) on an installation.

The *Security Engineering Facilities Planning Manual* serves as a bridge between installation planners, engineers, and security specialists, emphasizing the need for coordinated planning strategies. It acknowledges that while security and sustainable design may present challenges, they are not inherently in conflict (DoD, 2008). By integrating security considerations into master planning this document highlights the potential for reconciling planning goals with security requirements. Unlike UFCs that focus solely on planning or security, this manual offers a more holistic approach to land use decisions on military installations by encouraging multidisciplinary teams to align security measures with broader planning objectives

While civilian urban environments have successfully integrated defensive security features within public spaces, military bases continue to prioritize rigid zoning and restricted access policies, limiting opportunities for urban-like land use integration (Balletto et al., 2022). Despite these challenges, emerging research suggests that military bases can adopt select urban design strategies to improve livability, connectivity, and integration with surrounding

municipalities. Spanu (2023) argues that military urbanism influences the spatial production of cities, shaping infrastructure, land use policies, and governance models. Their research highlights opportunities to implement multi-layered security perimeters, develop shared-use spaces, and enhance pedestrian connectivity by redesigning internal circulation networks. This suggests that installations, such as Naval Station Bremerton, could align DoD planning frameworks with modern urban design principles as they evolve within urbanized regions, dually supporting regional development goals and operational effectiveness.

The findings from Barry-Jester (2017) and Lachman et al. (2016) highlight a central tension in military base urbanism: security-driven land use regulations prioritize controlled, auto-dependent layouts, often at the cost of walkability, mixed-use potential, and integration with surrounding communities. The question remains whether military base planning can incorporate more civilian land use strategies, particularly in areas where mission readiness and community accessibility intersect.

3.3.1 The Impact of Security Regulations on Base Urbanism

One key consequence of security-driven planning is the restriction of pedestrian mobility and land use flexibility within military bases. Research highlights how mandated physical barriers, setbacks, and controlled perimeters inhibit walkability and create isolated environments that resemble auto-dependent suburban models rather than integrated urban spaces (Barry-Jester, 2017). For example, minimum lane width standards and expansive road networks—originally designed for military vehicles—limit the feasibility of compact, pedestrian-oriented development. Barry-Jester (2017) critiques these auto-centric layouts, arguing that they contribute to urban fragmentation while providing limited empirical evidence for their purported safety benefits. These installations are required to assume that there are three main threats to

design against external explosive threats vehicle-borne or personnel Improvised Explosive Devices (IEDs), mail bombs, and weapons of mass destruction (chemical, biological, radiological weapons). These assumed threats (specifically the first threat) influence site and facility design most of all. This reflects a broader trend where security regulations override urban design best practices, often at the cost of accessibility, community integration, and environmental sustainability.

The UFC specifically and directly applies limitations and parameters for design decisions that impact base urbanism, often related to the goal of limiting the threats posed by explosives. “Unobstructed space” around the exterior of buildings is one such strategy imposed by the UFC to not provide anywhere to conceal a bomb. This buffer adds a layer of defense for each facility but also adds restrictions on how these facilities relate to the surrounding area. This standard establishes the requirement for a 33-foot ‘clear zone’ around all facilities yet allows for objects within it such as trees or benches if they are designed to not allow objects to be hidden.

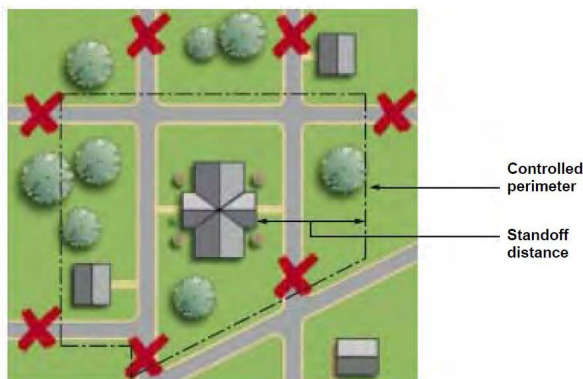


Figure 6: Creating Standoff by closing roads.
From UFC 4-020-01.

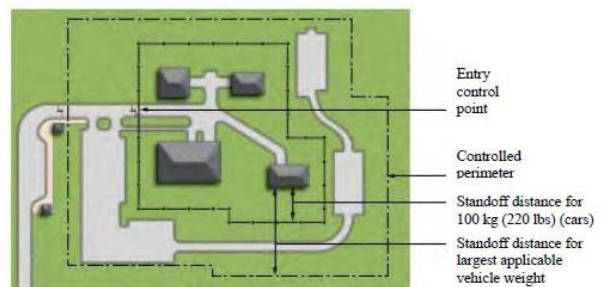


Figure 5: Standoff Distance. From UFC 4-020-01.

Issues within master planning focus on land-use planning, site planning, vehicle access, entry control points, and vehicle circulation. The UFC notes that “open circulation and common spaces on an installation, which are desirable from a conventional design perspective, may be undesirable from an antiterrorism perspective”. These guidelines note and highlight the possible

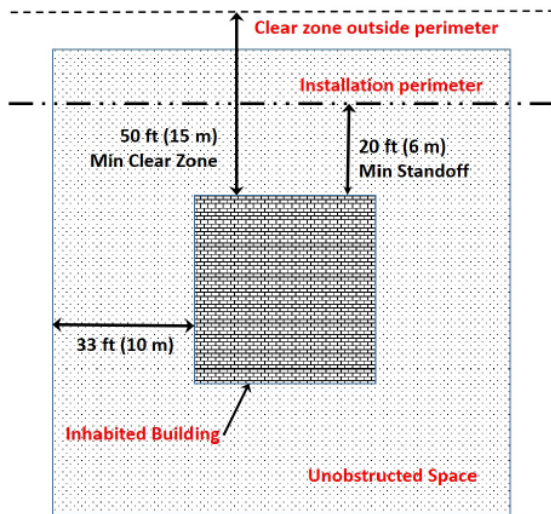


Figure 8: New standoff distance requirements.
From UFC 4-010-01.

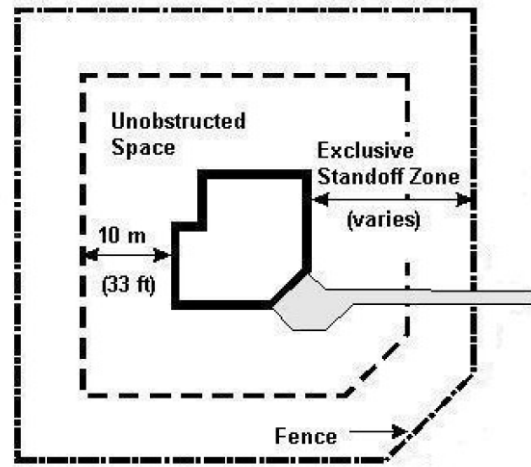


Figure 7: Unobstructed Space. From UFC 4-020-01

alignment of design strategies and security strategies, such as impassable landscaping being both an enhancement to anti-terrorism efforts and the environment and how clustering personnel and critical functions can provide more opportunities for creating limited standoff distance and smaller defended perimeters. It identifies the potential counter-productive effects of strategies being solely centered around security with discussion on concepts such as dispersal, with the UFC stating “while dispersal of buildings... reduces the risk that an attack on any location will impact others, such dispersal could have an isolating effect that reduces the effectiveness of existing security provisions, increases the complexity of the emergency response, and creates less defensible space” (DoD, 2008; Fenner, 2019).

The anti-terrorism standards exist to “minimize mass casualties in inhabited DoD buildings...” while also recognizing the reality of available resources by noting “the easiest and most cost-effective way to achieve this is to incorporate sufficient standoff distance to buildings”. Bases are driven to be spread out to both save lives and save money. Yet, the UFC also remains adaptable and at times will make significant updates to its regulations and thus its impacts to base planning possibilities. For example, one such significant change took place in 2018 by reducing the applicability of standoff distance requirements to only the installation’s perimeter (i.e. minimum of 20 feet) and removing any standoff requirements to an installation’s internal street network and parking. Some of this is an example of the guidance appearing to shift over time from a focus on creating hardened structures as a reactive strategy against explosives to a proactive strategy that focuses on a reduction in vehicle access points to an absolute minimum (as well as reducing vehicle speeds) to limit the threat at its source. Fortunately, this also allows for new design strategies to have some room for exploration and implementation where they originally did not have an avenue to be considered.

Outside of the DoD, this topic has been lightly discussed. One example is *FiveThirtyEight’s* “How Anti-Terrorism Design Can Also Make Cities More Livable,” which outlines how anti-terrorism designs have been incorporated into the urban fabric through accepted design principles. City and regional plans also discuss incorporating anti-terrorism into urban design, such as the DC Capital Region’s “The National Capital Urban Design and Security Plan,” which goes to great lengths to discuss anti-terrorism’s role at a local scale with specific site plans in the United States Capitol (Fenner, 2019). Overall, contemporary literature is often opinion pieces, local design spotlights, or separate and focused studies on issues of walkability or urban safety, but it does not take a comprehensive approach.

3.4 Gaps in Literature and Contributions

Despite existing research on military base redevelopment and land use compatibility, significant gaps remain in understanding active installations as evolving urban entities. While much of the current literature focuses on base closures and economic redevelopment, fewer studies examine how operational bases can adapt land-use strategies to improve base connectivity and mixed-use integration (Light, 2004; Balletto et al., 2022). Additionally, comparative assessments of multiple active bases remain relatively sparse, limiting the generalizability of recommended land use modernization strategies (Cowan, 2012; Balletto et al., 2022). Addressing these gaps is essential for advancing military-civilian synergy in land use. While base redevelopment studies provide valuable insights into post-closure land use adaptation, a critical research gap remains regarding how active military bases can modernize land use without compromising security and mission readiness (Light, 2004; Balletto et al., 2022). As Naval Station Bremerton evolves, lessons from base redevelopment projects could inform adaptive planning models for operational bases.

Chapter 4 Site Analysis

4.1 Spatial Analysis of Naval Station Bremerton

Naval Station Bremerton's spatial organization reflects the operational priorities and security requirements of a military installation while existing within the broader urban fabric of Bremerton, Washington. Unlike civilian urban environments, where land use planning prioritizes accessibility, connectivity, and mixed-use development, military bases often emphasize functional separation, controlled access, and secure perimeters. This section examines the spatial characteristics of Naval Station Bremerton, including land use patterns, connectivity, transit infrastructure, and public space design, to assess how its planning framework aligns with or diverges from contemporary urban design principles. By analyzing these elements, this study evaluates the degree to which military planning constraints shape spatial organization.

The Alignment/Tension Table (Table 5) provides a structured comparison of how military planning and urban design principles interact, highlighting areas of alignment, partial alignment, and tension across key design elements. This table serves as a synthesis of previous analyses, helping to identify where military land use strategies support or conflict with contemporary urban planning models.

Table 5: Summary of Comparison Between Design Elements and Military Planning Guidelines

| Alignment/Tension Table | | |
|---------------------------------|-------------------|--|
| Design Elements | Alignment/Tension | Explanation |
| Land Use Diversity | Tension | Military bases traditionally prioritize functional separation for security, while urban design practices encourage mixed-use environments |
| Connectivity | Tension | Urban principles favor permeability and open networks, while military security needs often restrict free movement and limit external connectivity |
| Public Space | Tension | Urban design promotes active, open public spaces, whereas military planning often discourages large, uncontrolled gathering areas due to security concerns |
| Transit & Mobility | Tension | Bases rely on private vehicles and restrict external transit access, while urban design principles emphasize multimodal connectivity and reduced car dependency |
| Hierarchy of Spaces | Alignment | Both military and urban planning recognize distinct zones (public, semi-public, private), though military bases enforce stricter boundaries for security |
| Legibility | Partial Alignment | Urban design encourages intuitive navigation, while military planning uses structured layouts but prioritizes security barriers that can reduce wayfinding clarity |
| Infrastructure Efficiency | Alignment | Military bases focus on self-sufficiency, which aligns with sustainable infrastructure principles in urban planning, though urban areas typically integrate municipal services more |
| Security & Safety | Alignment | Both urban design (via CPTED principles) and military planning prioritize security, though urban principles balance security with accessibility, while military bases prioritize restriction |
| Cultural/Institutional Identity | Tension | Military bases often reflect national identity rather than local cultural integration, whereas urban design supports regional and community-based identity formation |

This table provides a concise framework for understanding how military base planning can integrate select urban design principles while maintaining operational security. The identified tensions highlight barriers to urban-military integration, while areas of alignment suggest opportunities for adaptive planning strategies. One of the most significant areas of tension lies in connectivity, public space, and mobility. While urban design promotes permeability, walkability, and multimodal transit, military planning enforces separation, controlled access, and auto-dependency due to security requirements. Similarly, public spaces within military bases are highly constrained, as security concerns often limit large, open gathering areas, whereas urban planning prioritizes accessible, active public spaces for community engagement.

Despite these differences, there are notable areas of alignment, particularly in security, infrastructure efficiency, and spatial hierarchy. Both civilian urban planning and military planning prioritize safety and surveillance, with CPTED principles supporting controlled access and monitoring, although military applications tend to be more restrictive. Infrastructure efficiency is another shared priority, as military bases focus on self-sufficient water, power, and emergency systems, aligning with urban sustainability efforts. Additionally, both military and urban planning recognize distinct functional zones, though military zoning is more rigidly defined for operational security.

Some elements demonstrate partial alignment, particularly in legibility and cultural identity. Both systems value structured layouts, but while urban design encourages intuitive navigation and wayfinding, military planning prioritizes restricted movement and barriers, which can reduce navigational clarity. Cultural identity also diverges, as military bases primarily reflect national identity rather than integrating regional or community-based design elements, which are

central to urban placemaking. To conduct this spatial analysis, the process began with a high-resolution aerial map of Naval Station Bremerton (Figure 9), which provides a clear representation of the built environment, land use patterns, and surrounding urban context. This base image served as the foundation for the subsequent figure-ground analysis. Using the aerial map, all building footprints were manually or semi-automatically traced to create a figure-ground overlay (Figure 9). This process involved isolating structures by converting them into solid black shapes, while open spaces and streets were left white. Water was depicted in black as it contrasted well with the land. The result was a figure-ground map that highlights the density, layout, and distribution of built structures versus open space.

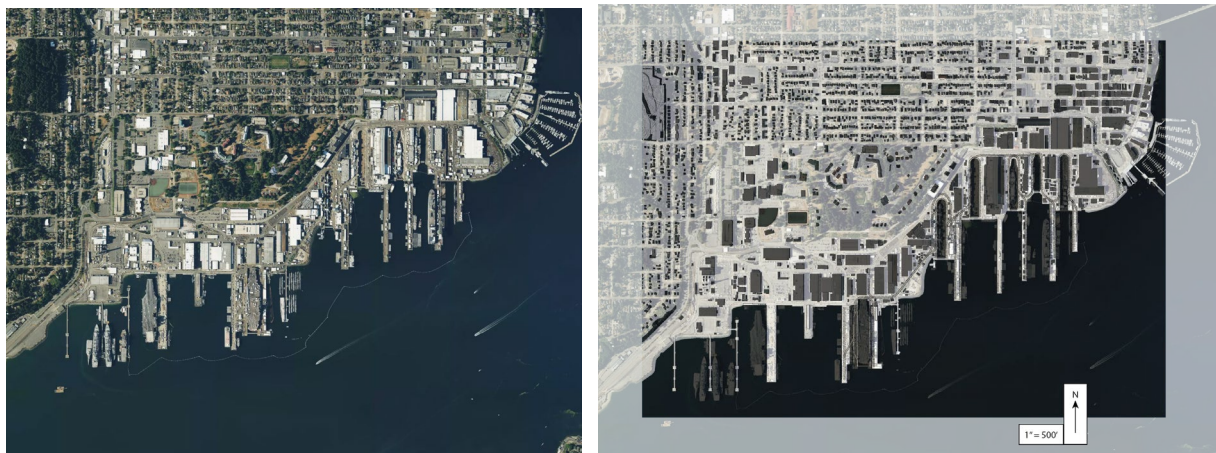


Figure 9: Aerial Image and Tracing of Naval Station Bremerton

After generating the initial overlay, refinements were made to ensure accuracy. This included adjusting edges, smoothing out inconsistencies, and ensuring proper alignment with real-world dimensions. The distilled figure-ground map represents the final, cleaned version, clearly delineating building masses and voids. Once the figure-ground map was complete, security perimeters, fencing layers, and controlled access points were overlaid to assess spatial segregation and connectivity (Figure 10). This step provided insights into how military planning

directives shape urban form, revealing the impact of security-driven design on pedestrian movement, accessibility, and integration with surrounding civilian areas.



Figure 10: Figure Ground

4.1.1 Land Use Patterns on Base

Like many military installations, Naval Station Bremerton exhibits functionally separated land use patterns for security and operational efficiency reasons. In Figure 11, I identified the key services and different uses of buildings and areas within the base perimeter, as well as some of the surrounding community. Afterward, I examined key functional zones (housing, amenities, operational waterfront, and restricted shipyard areas) to determine if uses were concentrated in separate yet clustered areas as seen in Figure 12. The Unified Facilities Criteria (UFC) guidelines

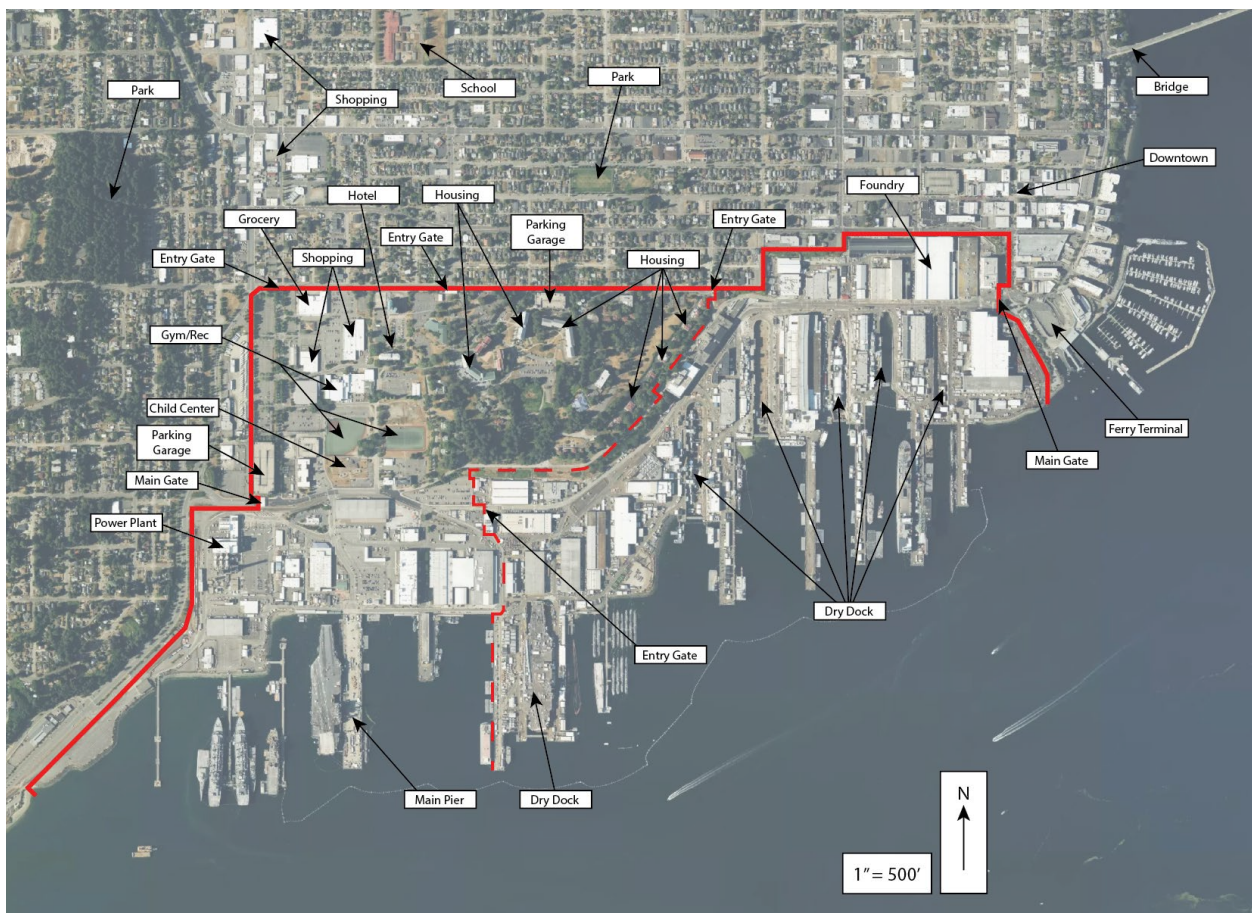


Figure 11: Aerial Image Depicting Key Buildings and Area Surrounding and on Naval Station Bremerton. Sourced from Google Earth. Created by Beau Sisemore.

have created a built environment that contrasts sharply with civilian urban spaces, limiting the integration of residential, commercial, and institutional uses through the establishment of standardized zoning practices across installations. Unlike civilian urban planning, where mixed-use zoning and compact development are encouraged to promote accessibility, efficiency, and community engagement, military planning prioritizes functional separation to reduce risks to security and maintain controlled access. UFC 2-100-01: *Installation Master Planning* defines land use categories (i.e. operational, residential, administrative, and industrial zones) and emphasizes keeping mission-critical areas isolated from housing and base amenities. While compact development is encouraged to optimize infrastructure costs and efficiency, security requirements such as setbacks, buffer zones, and access control measures frequently limit opportunities for denser, pedestrian-friendly environments.

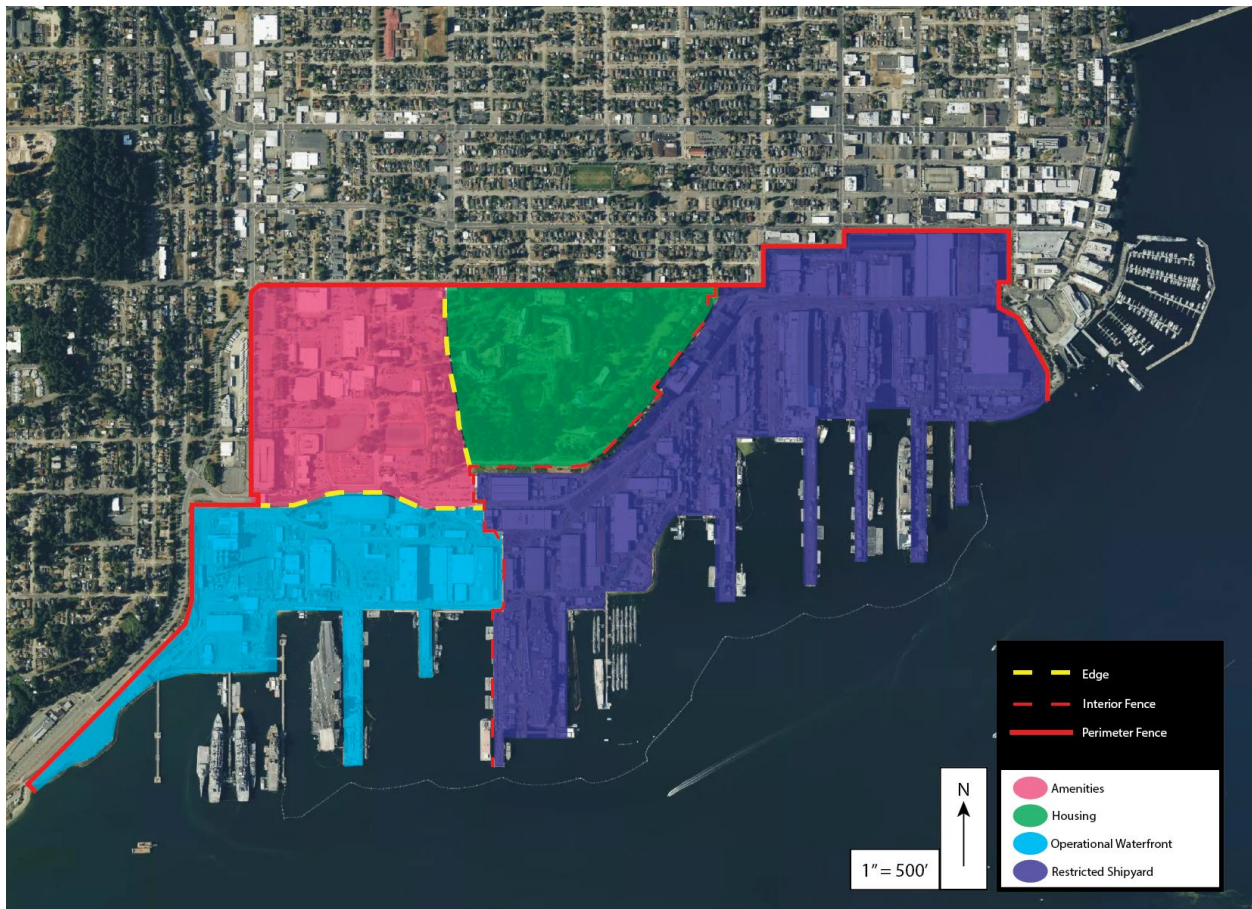


Figure 12: Functional Zones of Naval Station Bremerton

4.1.2 Security Zones

I outlined the base perimeter fence barrier and interior fence barriers, as seen in Figure 13, before determining which zones had higher security measures. Determining the location of fencing and entry points allowed me to map where the shipyard's higher security area began and ended, thus identifying a potential area with more design restrictions. The controlled entry points (black icons with arrows) indicate gateways for personnel and vehicles to enter and exit. The limited number of access points reinforces security but reduces permeability and connectivity with the adjacent urban fabric. Edge conditions (yellow dashed lines) represent transitional areas where different land uses or security levels intersect. These edges define separate public access areas for those with base access.

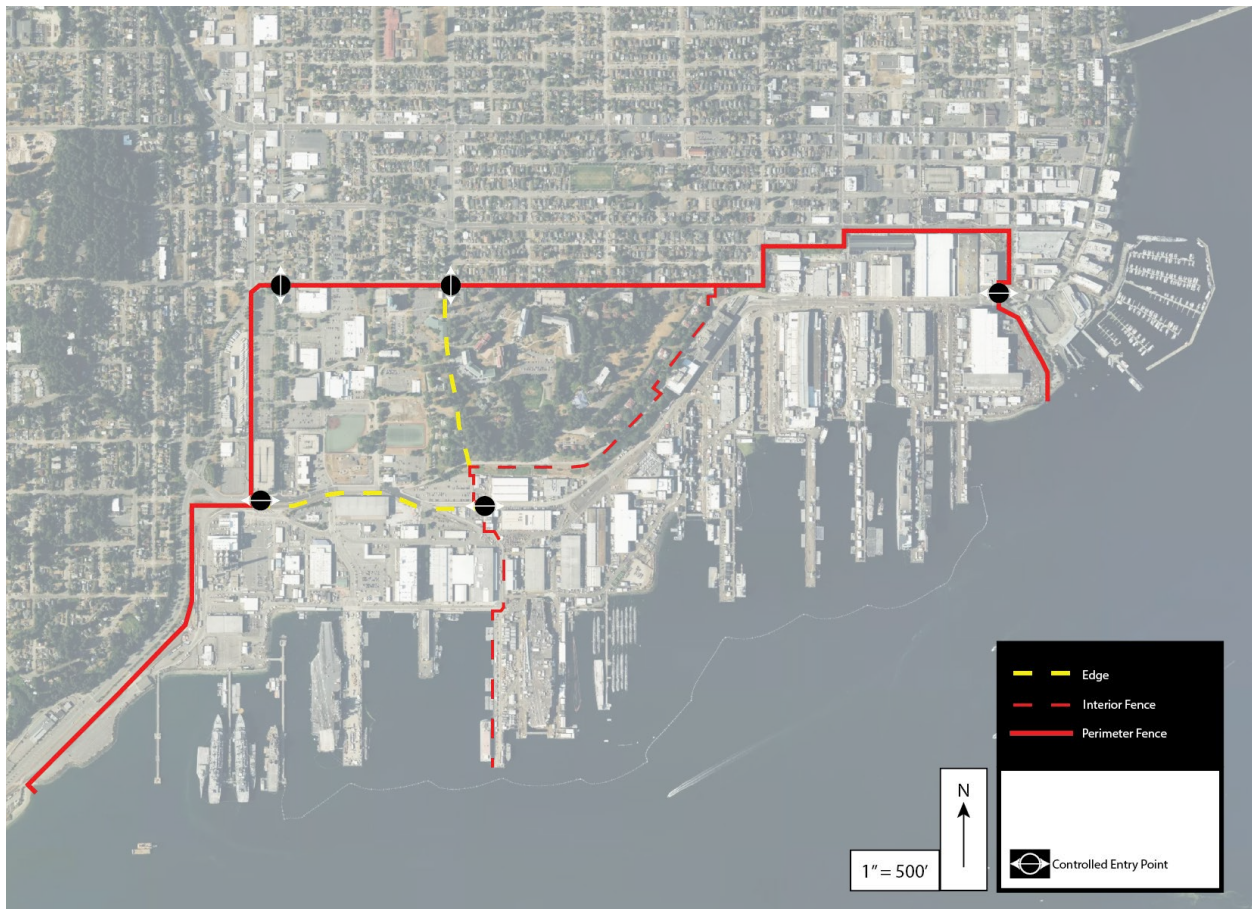


Figure 13: Security Perimeter and Entry Points

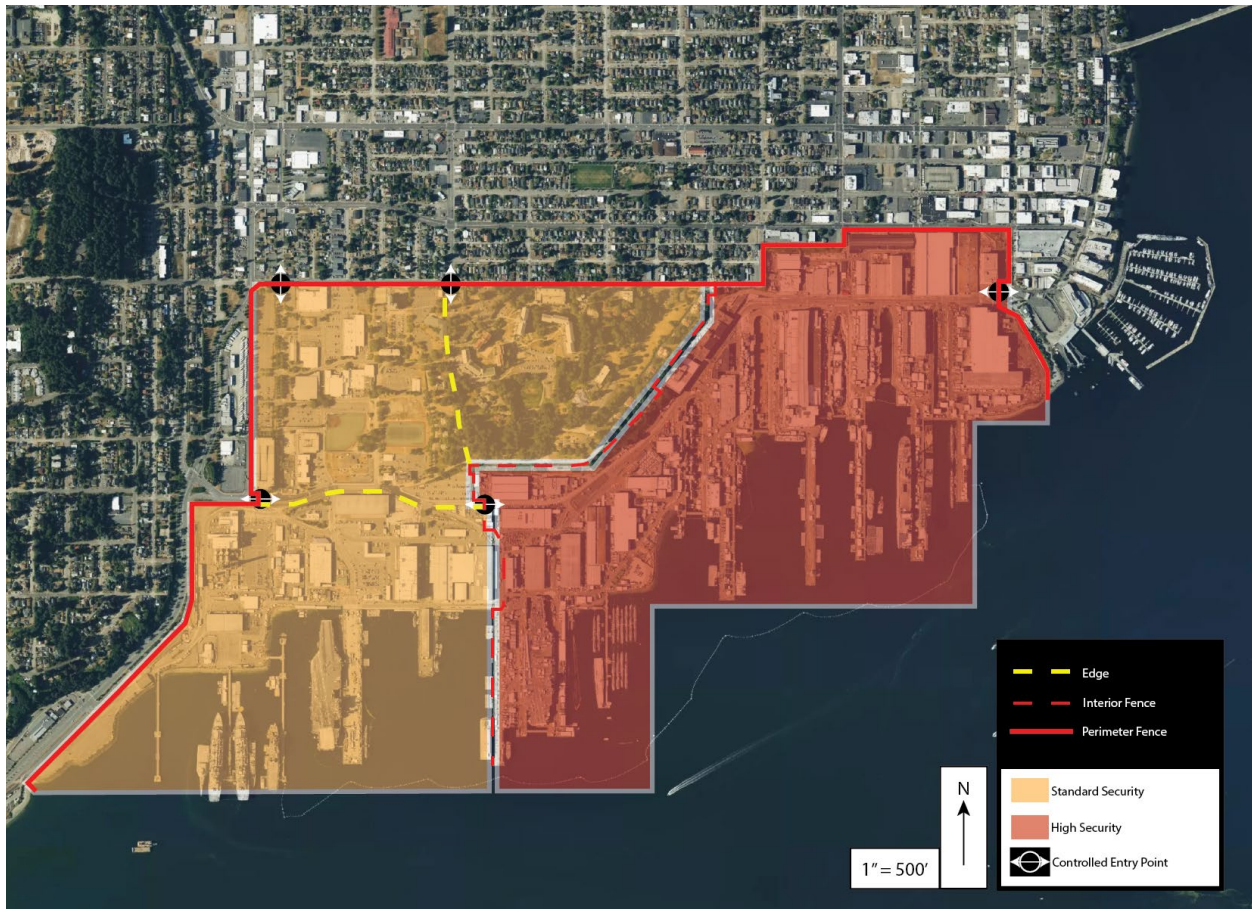


Figure 14: Level of Security Zones on Base

Figure 14 depicts the security zoning and access control framework at Naval Station Bremerton, highlighting different security levels, perimeter barriers, and controlled entry points (ECPs) that regulate movement and land use within the installation. The map divides the base into two primary security zones: Standard Security Zone (orange) and High-Security Zone (red). The Standard Security Zone includes administrative buildings, base support services, and housing. It is less restrictive compared to high-security areas but still requires controlled access. It is enclosed by a perimeter fence (red line) which defines the secured boundary of the base. The High-Security Zone primarily includes shipyard and mission-critical facilities, such as maintenance areas, dry docks, and operational infrastructure. It is restricted with additional

interior fencing (dashed red line), creating an extra layer of controlled access, limited to authorized personnel only.

4.1.3 Density and Organization

Using a figure-ground mapping technique, as seen in Figure 15, provides several key insights into spatial organization, density, and patterns on the installation.



Figure 15: Figure Ground of Naval Station Bremerton

The clear distinction between building typologies suggests a strict functional zoning approach, aligned with the UFC guidelines. The spacing and concentration of uses appear to be that of a cluster of high-density at the waterfront to pack industrial infrastructure closely together and a northern residential area with moderate density due to having multiple housing units near key amenities. Open spaces and buffer zones between the residential and industrial zones create gaps

in land use. The variations in density (high-density waterfront and lower-density residential) seem to contrast and create fragmented spatial organization. The western portion of the base appears underutilized, with larger lot sizes and fewer high-density structures. Overall, the base exhibits a low-to-moderate density of built structures, with large building footprints spread across extensive land parcels.

There are large operational and industrial buildings clustered near the waterfront, separated from the residential and administrative areas which are located further inland. These southern waterfront and industrial areas feature the largest and most widely spaced structures, which are consistent with shipyard/operational functions. The northern housing and administrative areas have smaller, more regularly spaced buildings which indicates lower density housing and office spaces. In contrast, outside the base perimeter, the civilian areas to the north and west display a finer-grained urban fabric that is typical of traditional neighborhood developments. The perimeter of the base is clearly defined by the contrast between the denser civilian neighborhoods and the installation's interior, creating a hard boundary.

4.1.4 Connectivity & Mobility

The base street network is fragmented, with large building footprints and open spaces creating significant breaks in connections and lacking a human scale at a pedestrian level. The base has a more irregular and discontinuous street pattern compared to the adjacent civilian area which follows a denser, gridded street layout. This suggests the priority toward vehicular movement over pedestrian movement. Along the waterfront, the long piers and linear industrial structures form an edge that creates a barrier to movement, with dead ends to circulation paths.

Connectivity and circulation patterns are heavily regulated by Department of Defense (DoD) policies and Unified Facilities Criteria (UFC) guidelines. UFC 4-010-01: *Anti-Terrorism*

Standards establish requirements for perimeter security, vehicle barriers, and minimum setback distances around buildings to mitigate threats from explosives. While these measures enhance force protection, they also limit street network permeability, creating large, disconnected parcels that reduce pedestrian accessibility. The emphasis on wide roadways, minimal intersections, and controlled access points results in a circulation network that contrasts with the dense, gridded street network often seen in surrounding neighborhoods.

DoD transportation policies encourage automobile dependency by outlining specific operational requirements that necessitate large roadways capable of handling military convoys, emergency response vehicles, and logistical transport. This approach contrasts sharply with contemporary urban planning principles, such as New Urbanism and Complete Streets, which promote compact, walkable environments with integrated transit and pedestrian infrastructure into the right-of-way. Civilian cities prioritize multi-modal networks that encourage biking, walking, and public transportation, whereas military installations tend to concentrate services in ways that necessitate vehicle travel due to convenience and safety

Naval Station Bremerton exhibits an auto-centric layout, with a hierarchical road network that prioritizes vehicle circulation. The figure-ground map (Figure 16) reveals wide arterial roads and dispersed building footprints, characteristics that reflect the installation's emphasis on vehicular access rather than pedestrian movement. Movement between zones is heavily car-dependent, with limited direct pedestrian connectivity between housing, amenities, and the waterfront. The main east-west roadways (Farragut Ave, Wycoff Way, and Cambrian Ave)

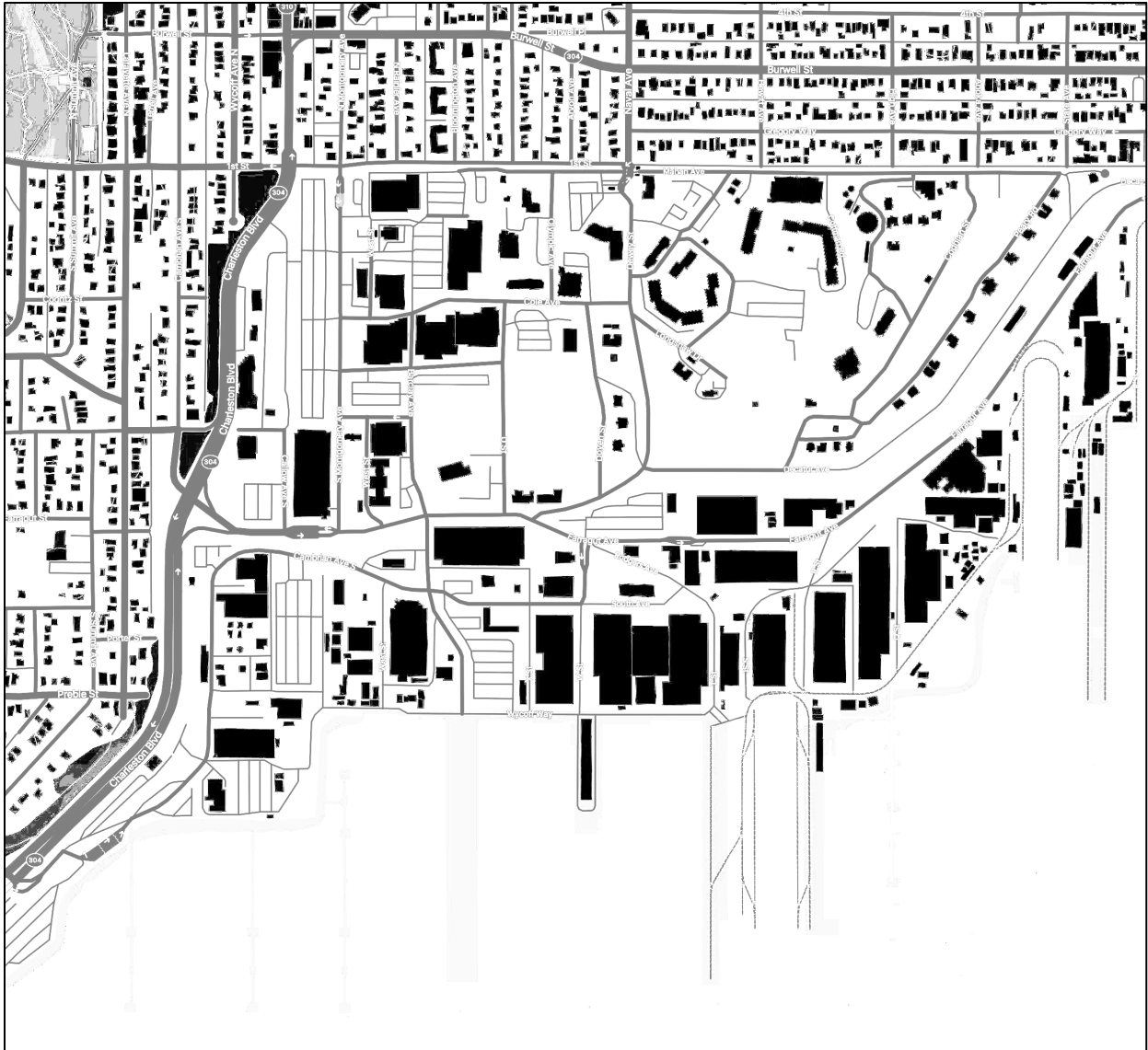


Figure 16: Figure Ground with Road Network

provide the primary means of connectivity between functional zones. The entry gates align with the civilian road network, but this does not necessarily mean greater integration with the surrounding urban fabric since internal circulation is controlled differently. The presence of large setbacks and security perimeters reinforces this vehicular dominance. Military regulations, such as UFC 4-010-01: *Anti-Terrorism Standards*, mandate controlled entry points and buffer zones. Unlike civilian urban areas that emphasize grid-based street networks to promote accessibility,

the road network within the base is less interconnected, with cul-de-sacs and dead-end streets reducing pedestrian continuity.

4.1.5 Public Space Design

Public space plays a critical role in urban environments by fostering social interaction, accessibility, and community engagement (Mehta, 2022). However, in military installations like Naval Station Bremerton, public spaces are often limited or highly regulated due to security-driven planning policies. The absence of transitional or semi-public spaces (i.e. plazas, pedestrian corridors) reinforces the base's function as a secured enclave rather than an integrated urban environment.

Installation Master Planning and Crime Prevention Through Environmental Design (CPTED) principles guide the planning of public spaces on military installations. These frameworks emphasize territorial reinforcement, natural surveillance, and controlled access, which influence the spatial design of public areas. Naval Station Bremerton uses physical barriers, fencing, and checkpoints to establish clear boundaries between controlled zones as outlined in these guidelines. The public spaces within military environments are designed for oversight and security, with strategic sightlines, surveillance cameras, and limited concealment to deter unauthorized access. In contrast, civilian urban planning integrates active street frontages, public plazas, and open gathering spaces to foster social interaction while maintaining safety.

4.1.6 Open and Green Spaces

An aerial image with highlighted green spaces provides insight into the distribution, accessibility, and function of vegetation and open space within Naval Station Bremerton. The location of green spaces within Naval Station Bremerton suggests that while some areas contain vegetation, the base lacks designated civic plazas, public parks, or pedestrian-friendly gathering spaces commonly found in civilian urban environments. Most open space is fragmented and appears utilitarian rather than designed for social engagement or leisure use.

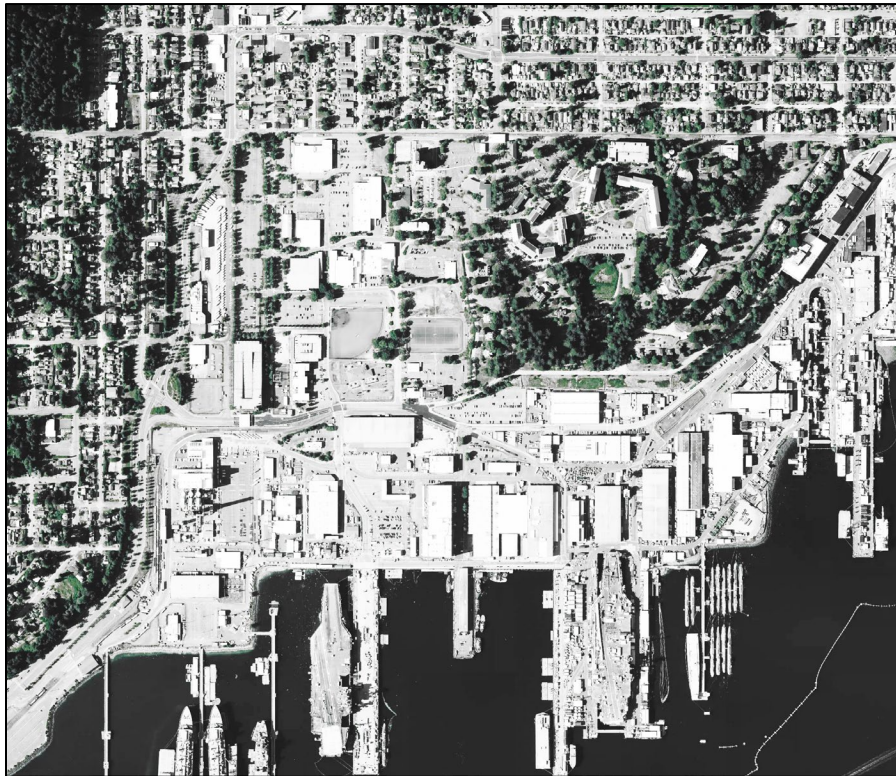


Figure 17: Aerial Map with Green Space Highlighted. Sourced from Google Earth. Created by Beau Sisemore.

Unlike a city where parks serve as central gathering spaces, the highlighted green spaces within the base are distributed in irregular patches, primarily around residential or administrative zones rather than in centralized locations for public use. This reinforces the territorial separation of these spaces rather than being openly accessible. While there are other pockets of green space,

they appear to serve specific military functions, such as buffer zones, controlled access corridors, or landscaping around housing and facilities, rather than acting as true public spaces. The only other intentional green spaces are controlled by recreational facilities, such as the ball fields. The base's proximity to the surrounding neighborhoods does not translate to any shared public space usage, with no visible public parks or plazas linking the base to the broader city. Not surprisingly due to the industrial and operational nature of the waterfront, there are no clear public spaces, continuous pedestrian paths, or accessible recreational areas along the shoreline.

The green spaces within the installation reflect a highly utilitarian design approach, serving functional and security purposes rather than prioritizing leisure, recreation, or public use.

Landscaping appears incidental rather than designed with green areas primarily adjacent to infrastructure and residential facilities. They appear to be acting as buffers rather than interactive, multi-use public spaces. Unlike city parks that integrate walkable pathways, seating, and public amenities, the military installation lacks pedestrian-oriented open spaces, reinforcing an auto-centric environment.

4.1.7 Lynch Diagram

Figure 18 provides a structured analysis of spatial organization, movement, and functional relationships at Naval Station Bremerton by mapping key urban design elements, including nodes, paths, edges and districts. This method, developed by Kevin Lynch in *The Image of the City* (1960), offers insights into how users perceive and navigate the base, identifying areas of connectivity, separation, and spatial hierarchy.

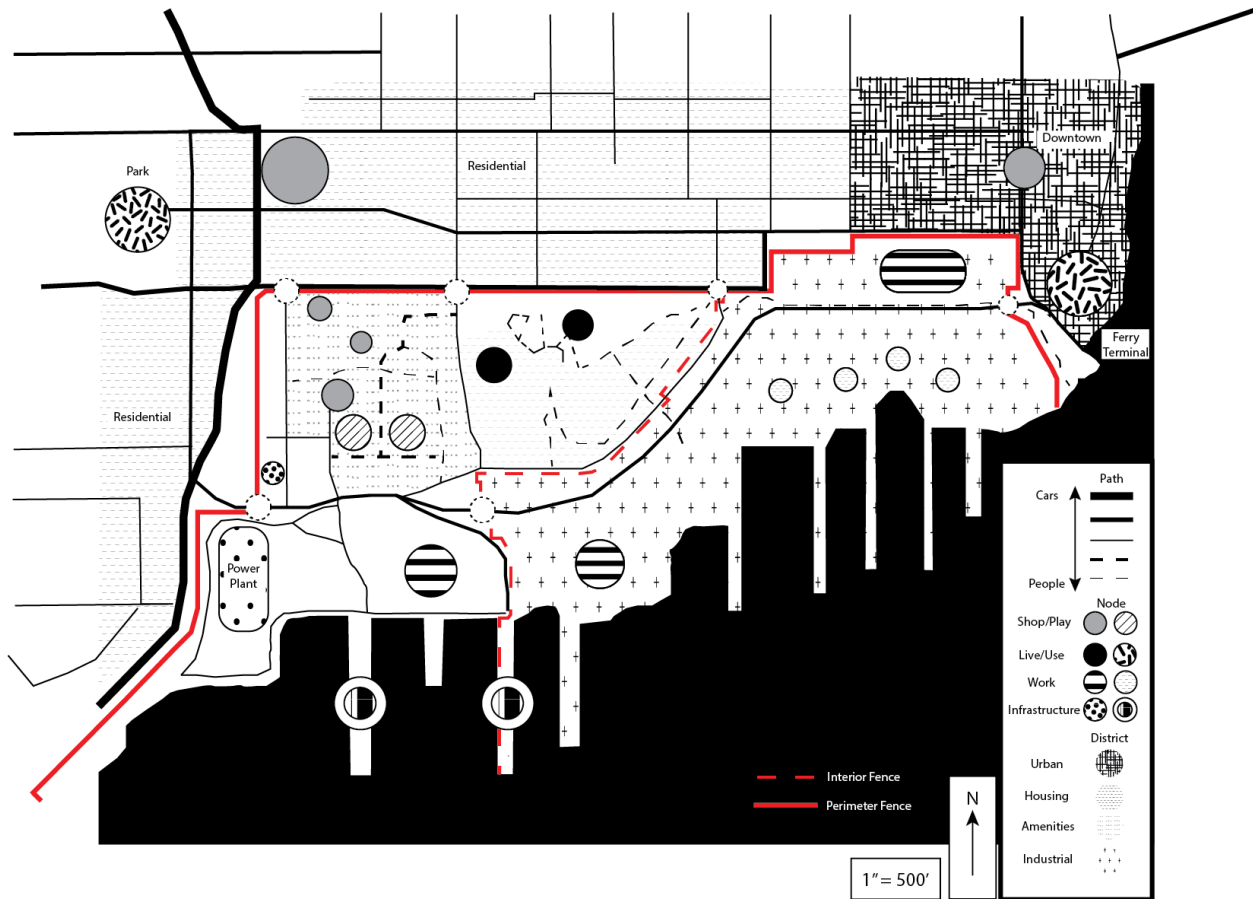


Figure 18: Lynch Diagram of Naval Station Bremerton

The base has a highly segmented layout with controlled access points, limiting pedestrian circulation across different zones. The northern section (near housing and community amenities) appears to have sidewalks and some green spaces, which could support walkability. The industrial and waterfront areas are less pedestrian-friendly due to security constraints, industrial

uses, and large-scale infrastructure like dry docks creating isolated circulation areas. While the northern portion of the base has pedestrian-friendly elements, the lack of mixed-use development and the physical separation between functional areas reduce walkability. Road networks prioritize vehicle access, and internal circulation is controlled, limiting how easily personnel can navigate between work, housing, and leisure.

Different functional areas link together to various degrees. The residential areas are concentrated and are connected by internal streets but separated from the waterfront. Community resources, such as the NEX Shopping Center and recreational areas, are near housing to create a semi-walkable environment between these zones. Intentionally, the shipyard, dry docks, and maintenance areas are physically and functionally separated from residential zones.

The diagram highlights hierarchical transportation routes, with major roads (solid lines) designed primarily for vehicular movement, reinforcing car dependency over pedestrian accessibility. Pedestrian pathways (dashed lines) are fragmented, limiting walkability and internal connectivity. The presence of security fences further constrains movement. Security fencing (perimeter and interior) creates hard edges, reinforcing the isolation of the base from its surrounding urban environment. The power plant and industrial zones function as additional barriers, restricting movement across the base and reinforcing single-use zoning patterns.

Limited access points into the installation funnel movement through a few controlled entry nodes, restricting urban permeability and engagement with adjacent neighborhoods. Key nodes of activity are diagrammed, including housing, amenities, and workspaces, showing their spatial arrangement is highly segmented. Housing nodes are in isolated clusters, separated from commercial and recreational areas, which reduces mixed-uses found in traditional urban

environments. Work and industrial zones dominate the waterfront, reinforcing the base's function as a secure operational facility rather than an integrated urban district.

The base functions as a series of isolated districts, each serving a specific purpose (housing, industrial, operational), limiting integration between uses. Housing districts are set apart from workspaces and amenities, reducing opportunities for spontaneous social interaction and contributing to a dormitory-style environment rather than a dynamic, community-oriented space. Amenities are compartmentalized, failing to serve as true public spaces. Nodes of activity are not well-connected, which diminishes the overall sense of place and weakens the relationship between urban form and user experience.

Chapter 5 Discussion

This chapter explores broader interpretations of the findings, discussing the limitations of the research, and potential future directions. The implications from these findings are connected back to the guiding question of this research: How do urban design practices compare to the codes and regulations of military installation design practices at Naval Station Bremerton? Where do these frameworks align, and where do they diverge? While the findings provide insights into spatial design at Naval Station Bremerton, additional considerations, such as governance structures, funding mechanisms, and military culture, also influence planning outcomes but were not directly addressed by the methods used in this study.

5.1 Interpretation of Findings

The spatial analysis and document review of Naval Station Bremerton reveal both points of alignment and divergence between military land use policies and urban design principles. While some aspects of military planning incorporate compact development strategies and infrastructure efficiency, key urban design priorities (i.e. walkability, mixed-use development, and public space) are significantly limited by security-driven spatial regulations.

Table 6 provides insights into how various urban design principles align or conflict with the security-driven planning approach at Naval Station Bremerton. The findings reveal both opportunities for integration and structural constraints imposed by military regulations, particularly in high-security areas.

Table 6: Summary of Security Levels on Integration of Design Principles

| Integration of Design Principles at Naval Station Bremerton | | | |
|---|---------------------------|---------------------------|---|
| Design Proposal | Standard Security | Highest Security | Explanation |
| Housing integrated with small-scale services (e.g., housing above commissary) | Supported | Not Supported | Restricted in high-security areas per UFC Minimum Antiterrorism Standards for Buildings, requiring separation of residential and operational functions. |
| Enhanced walkability between key areas (amenities, housing, waterfront) | Supported | Not Supported | Encouraged per UFC for improved quality of life, but must align with AT/FP setback requirements in secured zones. |
| Bike lanes or shuttle services between key base locations | Supported | Not Supported | Shuttle services are feasible. Bike lanes may conflict with UFC due to vehicle access control and roadway priority for military vehicles. |
| Enhancing strategic public spaces while maintaining security | Supported | Supported with Exceptions | Public spaces must be strategically located to avoid security risks but can be designed with controlled access. |
| Compact housing models within the base | Supported | Supported with Exceptions | Compact housing models are supported to maximize land use but must meet DoD minimum housing standards. |
| Signage and landmarks to improve base navigation | Supported | Supported | Wayfinding is encouraged to improve navigation, but signage must align with security protocols. |
| Alternative security measures that maintain openness (e.g., controlled public access zones) | Supported with Exceptions | Not Supported | Some alternative security measures can be implemented, but full openness is restricted by base security policies. |

| | | | |
|---|---------------------------|---------------------------|--|
| Mixed-Use Development in Key Zones | Supported | Not Supported | May be implemented in designated areas, but mixed-use zoning is often restricted within secure military zones. |
| Traffic Calming Measures | Supported with Exceptions | Supported with Exceptions | Limited application due to priority for military logistics and emergency vehicle access. |
| Community-Oriented Facilities (e.g., shared recreational spaces, co-working spaces) | Supported | Not Supported | Community facilities can be supported in designated zones but must avoid security-sensitive areas. |
| Perimeter Buffer Zones with Dual-Use Design | Supported | Supported with Exceptions | Buffer zones can serve dual purposes, but security remains the primary consideration for their design. |

5.1.1 Tension Between Walkability and Security

Enhanced walkability, bike lanes, and shuttle services are supported in standard security zones but not in high-security areas. While the Unified Facilities Criteria (UFC) encourages walkability, implementation is constrained by Anti-Terrorism/Force Protection (AT/FP) standards, which require setbacks and controlled access. The lack of pedestrian priority in high-security zones reflects the dominance of vehicle-centric planning, limiting the feasibility of mixed-mobility approaches. While pedestrian infrastructure can be improved in lower-security areas, key barriers such as limited entry points, fencing, and security screening zones will continue to inhibit full integration with surrounding urban areas. Security remains a central organizing principle for military installations, often leading to highly restrictive land use patterns that prioritize defensible perimeters, controlled mobility, and large buffer zones. Barry-Jester

(2017) explores how urban security design strategies can serve a dual purpose of enhancing safety while also improving public spaces, suggesting that military installations can integrate aesthetically functional barriers such as bollards, planters, and controlled-access streets without compromising security. This aligns with broader trends in urban design and counterterrorism planning, where the goal is to embed protective measures within the built environment without creating an oppressive, militarized atmosphere.

5.1.2 Housing and Mixed-Use Development Are Restricted by Security Priorities

Compact housing models are partially supported, but mixed-use development is not allowed in high-security areas. The separation of residential and operational functions reflects a fundamental conflict between urban design principles and military planning mandates. Unlike civilian urban centers where mixed-use zoning fosters economic activity and social interaction, military bases adhere to strict zoning separation to minimize security risks. The lack of integration between housing, commercial amenities, and workplaces reinforces an insular environment. While incremental adjustments, such as integrating small-scale commercial services within standard security zones, could improve daily convenience for base personnel, full mixed-use development remains unlikely due to DoD land use separation policies.

5.1.3 Public Spaces and Alternative Security Approaches

Strategic public spaces are supported in standard security areas but require controlled access. Alternative security measures that promote openness (e.g., controlled public zones) are only supported with exceptions and not allowed in high-security areas. The table highlights the trade-off between security and community-oriented design. While urban planning emphasizes public spaces for interaction and placemaking, military bases prioritize territorial reinforcement and restricted access. Some hybrid solutions, such as controlled public access zones (e.g., visitor-

friendly greenways or waterfront areas), might be feasible, but full openness is restricted. The possibility of strategic placement of public spaces within standard security areas (e.g., housing clusters or administrative zones) could provide a middle ground between security needs and urban livability. However, fencing and perimeter controls will continue to limit accessibility, making integration with civilian areas challenging.

5.1.4 Wayfinding and Navigation Enhancements Align with Best Practices

Signage and wayfinding improvements are fully supported across all security levels. This suggests that clearer navigational aids, improved signage, and landmark-based orientation tools are not viewed as security risks and are even encouraged for operational efficiency. While urban design strategies related to pedestrian infrastructure face significant hurdles, wayfinding enhancements represent a low-cost, high-impact improvement that aligns with both military needs and urban best practices.

5.1.5 Balancing Traffic and Security Needs

Traffic calming measures are only supported with exceptions, reflecting concerns over emergency and military logistics. The need to preserve emergency vehicle access limits the extent to which speed reduction strategies, narrower lanes, or pedestrian-prioritized street designs can be implemented. However, certain measures, such as roundabouts, designated pedestrian crossings, or buffered bike lanes in non-critical areas, might still be feasible. A tailored approach could enhance both mobility and safety. For example, vehicle-priority roads are maintained in operational areas, while housing and administrative zones incorporate safer pedestrian-oriented designs.

5.1.6 Community-Oriented Design Remains Secondary to Mission Readiness

Community facilities (e.g., shared recreational spaces, co-working hubs) are supported in some areas but restricted in high-security zones. While military communities require social spaces to foster well-being, these amenities are often designed for internal use only. The restrictions in high-security areas further reinforce the separation between military and civilian life, contributing to base isolation. The creation of designated community hubs in standard security zones could enhance the quality of life for military personnel, but these spaces will remain largely inaccessible to the surrounding civilian population.

5.1.7 Buffer Zones as a Compromise Between Security and Urban Design

Perimeter buffer zones are supported but remain security focused. While buffer zones could be designed for dual-use purposes, such as stormwater management, green infrastructure, or passive recreation, security remains the primary driver of their configuration. Bases could adopt landscape-based security strategies (e.g., using tree buffers instead of hard fencing) to create more visually permeable and ecologically beneficial perimeters without compromising defense requirements.

5.2 Alignment: Where Military Environments and Urban Design Intersect

Despite their differences, military and civilian planning frameworks share some common objectives, especially regarding land use efficiency, infrastructure resilience, and sustainability. UFC 2-100-01 emphasizes compact land use to reduce infrastructure costs and improve internal efficiency, which is similar to urban design principles that advocate for densification and infill development. Although segregated into functional zones, these zones tend to become clusters of their specific purpose (for example, housing or administrative) where they reflect compact

layouts to optimize utilities and operational logistics between these common uses. Both military and civilian frameworks prioritize functional zoning for its efficiency and land conservation, with Naval Station Bremerton's industrial, administrative, and residential zones mirroring the separation seen in urban industrial parks and some transit-oriented employment centers.

5.3 Divergence: Where Military Environments and Urban Design Conflict

There are several fundamental differences between military base policies and urban design practices. They illustrate the unique challenges of adapting contemporary urban design principles to military contexts. Military planning prioritizes security over connectivity, resulting in rigidly controlled access points, perimeter security measures, and strict functional separation. These policies limit pedestrian movement and create a high dependency on vehicular transportation. Unlike civilian urban environments, which emphasize continuous street networks and transit-oriented development, military installations lack cohesive circulation patterns, restricting movement between zones. This is evident in the figure-ground map of Naval Station Bremerton, which illustrates an irregular street network with fragmented connectivity. The spatial organization of the base reflects military land use priorities, where operational security takes precedence over urban mobility, further reinforcing separation between different functional areas and limiting walkability.

Walkability and public space on military installations are heavily constrained by anti-terrorism standards, which prioritize security over accessibility. While urban planning frameworks such as New Urbanism and Complete Streets emphasize pedestrian-friendly environments and public engagement, military bases implement large setback distances, security buffers, and restricted access zones that limit opportunities for walkability and community interaction. Findings from Naval Station Bremerton illustrate this contrast, where public spaces

primarily function as controlled-use areas, such as training grounds and housing courtyards, rather than open civic spaces designed for informal gatherings. These restrictions not only limit pedestrian mobility but also reinforce the base's isolation from surrounding civilian areas. The lack of shared public spaces and integrated walkable environments impacts both the quality of life for military personnel and opportunities for community engagement, highlighting a fundamental divergence between military land use policies and urban design principles.

Land use segregation on military installations conflicts with contemporary urban design trends that emphasize mixed-use development for livability and economic vibrancy. While civilian urban planning encourages the integration of residential, commercial, and recreational spaces to foster dynamic and accessible environments, military regulations enforce strict land use separation to maintain security and operational control. Findings from Naval Station Bremerton illustrate this contrast, as the adjacent civilian areas exhibit a blended mix of housing, businesses, and public spaces, while the base remains rigidly zoned into distinct functional areas for housing, industrial activities, and administrative operations. This separation limits interaction between different land uses and reduces opportunities for a more integrated and adaptable environment, further reinforcing the isolation between military and civilian spaces.

5.4 Implications for Integration Between Military and Civilian Frameworks

The findings underscore the structural and policy-driven differences between military base planning and contemporary urban design principles. This tension limits opportunities for seamless military-civilian spatial framework integration and highlights key areas where incremental adaptation could improve connectivity, accessibility, and operational efficiency. The Urban Design Concepts Matrix (Table 3) and Land Use Analysis Matrix (Table 4) provide a

structured comparison of urban planning approaches and military base land use policies, highlighting specific areas of alignment, tension, and potential for adaptation.

This study builds off military base analysis methodology from past studies, despite differences in their focus on base closures. More specifically, it contributes to the growing literature on active military installations as unique urban environments, building on the approach of examining spatial organization, walkability, and policy frameworks in tandem (Balletto et al, 2022; Ashley et al, 2016). Much like their analysis of military enclaves' connectivity and decision-making processes, this research combines document analysis with visual interpretation of land use patterns, resulting in a comprehensive look at how Naval Station Bremerton's spatial design interacts with contemporary urban design principles. This study examines land use and design regulations at Naval Station Bremerton primarily through military planning guidelines, including the Unified Facilities Criteria (UFC) and other Department of Defense (DoD) planning standards. Given that military installations operate under federal jurisdiction and are not subject to local zoning laws, the analysis focuses on how these military-specific frameworks shape spatial organization and design within the base. By focusing on an active naval base rather than a decommissioned or "mothballed" installation, the study addresses a substantive gap in the military planning literature, identifying feasible strategies for integration and compatibility under existing defense mandates.

Additionally, the development of a replicable approach for analyzing military land use structures in comparison to civilian urban design frameworks provides a methodological model that applies to other installations beyond Naval Station Bremerton. By focusing on spatial organization and regulatory constraints, this research offers a policy-informed perspective on

enhancing on-base livability, improving mobility, and fostering a stronger sense of community among service members while maintaining mission readiness.

5.4.1 Mixed-Use versus Functional Separation

Military bases emphasize functional separation (i.e. distinct zones for housing, operations, and recreation), whereas urban models favor mixed-use districts that enhance accessibility and livability. The Table 3 matrix highlights the tension between military zoning and urban mixed-use principles, noting that Bremerton's adjacent civilian areas integrate residential, commercial, and recreational uses, whereas the base maintains rigid zoning divisions. Introducing limited mixed-use nodes, such as housing with small-scale retail or services, could enhance convenience without compromising security. This would align with the goal of vertical mixed-use in a single facility as proposed within the UFC for *Installation Master Planning*.

It becomes a paradox between rigid and flexible strategies. Unlike urban areas that evolve with demand, military bases operate under strict zoning mandates that prevent the adaptive reuse of underutilized areas. Some bases have explored multi-functional spaces that serve operational needs but can be reconfigured for community engagement. This combined with phased zoning policies could allow adaptive reuse of underutilized base land for increased efficiency.

5.4.2 Pedestrian versus Auto-Centric Infrastructure

Large setbacks, controlled entry points, and wide roadways prioritize vehicle movement over pedestrian access, in contrast to urban Complete Streets models that integrate walkability and transit options. Findings from Table 4 indicate fragmented pedestrian pathways and long distances between key zones, discouraging walkability. Strategic enhancements to pedestrian corridors and transit access at base entry points could facilitate multi-modal integration. Options could include perimeter greenways and pedestrian corridors that improve walking connectivity

while maintaining security buffers. Bases have also coordinated with local governments to align multi-modal transit hubs near base entry points that facilitate military-civilian transportation linkages and investments in bus and bike infrastructure on installation.

5.4.3 Public Space Limitations

Public spaces on military bases serve functional needs rather than fostering civic engagement, limiting informal gatherings and military-civilian interaction. Military public spaces are isolated and utilitarian, contrasting with the multifunctional, community-oriented spaces found in urban environments. Exploring controlled-access public spaces near base perimeters could provide shared-use recreational opportunities while maintaining security. Few shared-use developments exist, despite growing interest in base-community partnerships. Some bases have experimented with visitor-friendly commercial areas near entry points to encourage economic and social integration.

5.5 Challenges and Future Research Directions

Despite growing interest in integrating military land use planning with contemporary urban design principles, several structural, cultural, and logistical barriers complicate this effort. One of the most significant challenges is funding and bureaucratic constraints. Military budgets are primarily allocated toward mission-essential infrastructure, such as operational facilities, training areas, and security enhancements, leaving limited resources for innovative land-use strategies that prioritize walkability, mixed-use development, or public space improvements. This funding structure often limits the ability of military installations to explore progressive planning models seen in civilian cities, where investments in transit, placemaking, and sustainability initiatives are more common.

Compounding these financial challenges is the issue of governance and decision-making within military installations. Unlike civilian municipalities, where long-term planning efforts are often carried out by dedicated planning departments and local agencies, military bases experience frequent leadership turnover. Commanding officers typically rotate every two to three years, which can disrupt continuity in long-term infrastructure and land use planning efforts. As a result, strategic urban planning initiatives that require consistent oversight, phased implementation, and stakeholder collaboration may struggle to gain traction, as new leadership often arrives with shifting priorities and mission requirements.

Additionally, military culture and community design play a critical role in shaping base planning decisions. Military installations are designed to serve the needs of service members, their families, and operational staff, often emphasizing controlled access, housing proximity to work centers, and self-sufficiency within base perimeters. However, this insular approach to community planning may not fully account for the evolving preferences of military personnel, particularly younger service members who may value greater mobility, interaction with surrounding cities, and access to diverse amenities. Future research could explore how service members and their families perceive on-base versus off-base living environments, shedding light on how planning decisions align or diverge from their actual needs.

5.5.1 Comparative Case Studies Across Other Bases

A key avenue for further research involves comparative case studies of other military bases to assess variations in planning approaches and integration strategies. For example, Joint Base Lewis-McChord (JBLM), another major installation in Washington State, has undertaken initiatives aimed at improving military-civilian connectivity, such as transit-oriented development projects and land use partnerships with local jurisdictions. Examining how JBLM's

planning strategies differ from those of Naval Station Bremerton could provide valuable insights into the feasibility of adapting urban design principles within different military contexts.

Additionally, international military installations offer a unique perspective on military land use planning. Countries with different urban planning traditions, such as Germany, South Korea, and Japan, have integrated military bases into dense urban environments with varying degrees of success. Researching how these installations balance security requirements with urban accessibility could reveal alternative governance models, infrastructure designs, and policy mechanisms that may be adaptable to U.S. military installations.

5.5.2 Qualitative Research on Social Dynamics

While this study has focused primarily on spatial and regulatory analysis, future research could incorporate qualitative methods to better understand the social dimensions of military land use planning. Surveys or interviews with service members, their families, and nearby civilian residents could provide a more nuanced perspective on how base planning decisions impact social integration, mobility, and quality of life. Key research questions could include: *How do on-base and off-base residents perceive accessibility and connectivity between the installation and the surrounding community? Do military families prefer to live on-base or off-base, and what factors influence these decisions? How do security measures impact daily life and social interaction within and around military installations?* By incorporating personal experiences and stakeholder insights, qualitative research could reveal hidden barriers to integration and identify policy interventions that align better with the lived experiences of military personnel and civilians.

5.6 Limitations

This thesis examined the relationship between land use, urban form, and planning frameworks for military installations such as Naval Station Bremerton. While the study provides valuable insights into how military base planning compares with contemporary urban design principles, several limitations must be acknowledged regarding scope, data availability, and methodological constraints.

5.6.1 Scope and Generalizability

One of the primary limitations of this study is its focus on a single military installation. While Naval Station Bremerton serves as a relevant case study due to its proximity to an urban municipality and its distinct land use patterns, the findings may not be directly applicable to all military bases with their differing geographical, historical, or operational contexts. Bases located in more remote or strategically sensitive locations, those with different historical contexts, or those with varying levels of civilian-military interaction may exhibit different land use characteristics and challenges.

5.6.2 Data Constraints

This research primarily relied on publicly available geographic datasets, land use data, existing surveys, and Department of Defense planning guidance. The lack of access to internal DoD planning documents, such as Naval Station Bremerton's Installation Development Plan, as well as proprietary datasets, limited the depth of analysis that could be conducted. Additionally, while existing surveys provide insight into military family experiences, they may not fully capture nuanced perspectives on integration, isolation, or urban form perceptions. A more robust dataset, including primary data collection through surveys or interviews, could provide a richer, more comprehensive understanding of how urban design impacts military communities.

5.6.3 Methodological Considerations

Given the constraints of time and data availability, I employed a descriptive spatial analysis approach rather than a mixed-methods strategy that incorporates both quantitative and qualitative perspectives. While spatial analysis effectively identifies land use patterns and accessibility issues, it does not capture the lived experiences of military personnel, their families, or civilians in adjacent communities. Future research could benefit from qualitative methods such as interviews, focus groups, or participatory mapping exercises to better understand the human dimensions of base-community interactions and the social impacts of military planning decisions.

5.6.4 Policy and Implementation Challenges

Even if this study identifies land use strategies that could enhance the quality of life on military bases, the practical implementation of such strategies within the constraints of military planning processes remains an enduring challenge. Military installations operate under rigid land use policies driven by security measures and operational readiness concerns, the purposes of which are both logical and valuable considering the unique threats these communities may be subject to. Unfortunately, it leaves little room for flexible planning solutions seen in the civilian sector. The funding structures that these installations fall under also may not align with the broader objectives of urban planning, leaving installation commanders with few methods to fund improvements. As can be inferred from the guidance within the Universal Facilities Criteria, military base planning is pushed toward decisions that will save lives and save money. Additionally, the transient nature of military leadership further complicates long-term planning, as frequent rotations create continuity gaps that can hinder the execution of sustained, long-term development initiatives.

5.7 Conclusion

This thesis contributes to the ongoing discourse on military base urbanism by examining how land use and urban form align with the decisions made at Naval Station Bremerton. The findings highlight the complex relationship between military planning regulations and urban design principles, identifying areas where these frameworks align and where they diverge.

5.7.1 Land Use and Accessibility Impact Community Integration

The spatial organization of the base, including the distribution of housing, commercial services, and gate access points, significantly affects the level of interaction between military personnel and the surrounding community. Bases designed with limited entry points and internalized services may inadvertently reinforce separation rather than integration.

5.7.2 Urban Fabric and Connectivity Matter

Urban design research consistently demonstrates that walkability, transit access, and mixed-use development enhance social interaction and economic vitality. However, military installations often prioritize single-use zoning and controlled access, creating physical and social barriers that impede integration. Expanding pedestrian infrastructure, transit connections, and mixed-use spaces could facilitate greater mobility and interaction between military personnel and civilians within the installation as well as in the surrounding area.

Bibliography

- Abrahams, Diane. 2008. "Military Base Conversion in South Africa: Opportunities for Local Economic Development." *Urban Forum* 19 (1): 43–60. <https://doi.org/10.1007/s12132-008-9026-9>.
- Ashley, Amanda Johnson, and Michael Touchton. 2016. "Reconceiving Military Base Redevelopment: Land Use on Mothballed U.S. Bases." *Urban Affairs Review* 52 (3): 391–420. <https://doi.org/10.1177/1078087414568028>.
- Bagaeen, Samer Ghaleb. 2006. "Redeveloping Former Military Sites: Competitiveness, Urban Sustainability and Public Participation." *Cities* 23 (5): 339–52. <https://doi.org/10.1016/j.cities.2006.05.002>.
- Balletto, Ginevra, Mara Ladu, Alessandra Milesi, Federico Camerin, and Giuseppe Borruso. 2022. "Walkable City and Military Enclaves: Analysis and Decision-Making Approach to Support the Proximity Connection in Urban Regeneration." *Sustainability* 14 (January). <https://doi.org/10.3390/su14010457>.
- Barry-Jester, Anna Maria. 2017. "How Anti-Terrorism Design Can Also Make Cities More Livable." *FiveThirtyEight* (blog). November 7, 2017. <https://fivethirtyeight.com/features/how-anti-terrorism-design-can-also-make-cities-more-livable/>.
- Batty, Michael. 2013. *The New Science of Cities*. Cambridge, UNITED STATES: MIT Press. <http://ebookcentral.proquest.com/lib/washington/detail.action?docID=3339700>.
- Bloomberg, Michael, David Burney, Thomas Farley, Janette Sadik-Khan, and Amanda Burden. "ACTIVE DESIGN GUIDELINES." New York: New York City Departments of Design and Construction (DDC), Health and Mental Hygiene, Transportation (DOT), and City Planning, 2010. <https://centerforactivedesign.org/dl/guidelines.pdf>.
- Bradshaw, Ted K. 1999. "Communities Not Fazed: Why Military Base Closures May Not Be Catastrophic." *Journal of the American Planning Association* 65 (2): 193–206. <https://doi.org/10.1080/01944369908976047>.
- "Building Resilience: Crime Prevention Through Environmental Design | WBDG - Whole Building Design Guide." n.d. Accessed August 20, 2024. <https://www.wbdg.org/resources/crime-prevention-environmental-design>.
- Casserly, Brian Gerard. n.d. "Securing the Sound: The Evolution of Civilian-Military Relations in the Puget Sound Area, 1891–1984." Ph.D., United States -- Washington: University of Washington. Accessed August 20, 2024. <https://www-proquest-com.offcampus.lib.washington.edu/docview/304792457/abstract?parentSessionId=PF7taHLIc3G7cTYLYcW%2FRj%2BkAjOAJ2j1rGCRc%2FcP%2BQ%3D&sourcetype=Disertations%20&%20Theses>.

- Chen, Tzu-Hsin Karen, Henriette Thisted Horsdal, Karl Samuelsson, Ane Marie Closter, Megan Davies, Stephan Barthel, Carsten Bøcker Pedersen, Alexander V. Prishchepov, and Clive E. Sabel. 2023. "Higher Depression Risks in Medium- than in High-Density Urban Form across Denmark." *Science Advances* 9 (21): eadf3760. <https://doi.org/10.1126/sciadv.adf3760>.
- Chen, Tzu-Hsin Karen, Chunping Qiu, Michael Schmitt, Xiao Xiang Zhu, Clive E. Sabel, and Alexander V. Prishchepov. 2020. "Mapping Horizontal and Vertical Urban Densification in Denmark with Landsat Time-Series from 1985 to 2018: A Semantic Segmentation Solution." *Remote Sensing of Environment* 251 (December):112096. <https://doi.org/10.1016/j.rse.2020.112096>.
- Chun Tie, Ylona, Melanie Birks, and Karen Francis. 2019. "Grounded Theory Research: A Design Framework for Novice Researchers." *SAGE Open Medicine* 7 (January):2050312118822927. <https://doi.org/10.1177/2050312118822927>.
- Clanahan, Christopher M. 2021. "Urbanized Defense Communities: A Literature Review on the Policies, Politics, and Planning of Military Readiness and Local Land Use in the United States." *Journal of Planning Literature* 36 (3): 358–72. <https://doi.org/10.1177/08854122211012720>.
- Cloutier, Daniel. 2020. "Efficacy of Military and Community Compatibility Planning in the Puget Sound Region." ProQuest Dissertations & Theses.
- Cowan, Tadlock. (2012). Military Base Closures: Socioeconomic Impacts." *Congressional Research Service* 7-5700, RS22147 (February 2012). Retrieved from <https://fas.org/sgp/crs/natsec/RS22147.pdf>.
- Cozens, Paul, and Terence Love. 2015. "A Review and Current Status of Crime Prevention through Environmental Design (CPTED)." *Journal of Planning Literature* 30 (4): 393–412. <https://doi.org/10.1177/0885412215595440>.
- Creswell, John W., and J. David Creswell. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Fifth. Thousand Oaks: SAGE Publications, 2018.
- Department of Defense. "DoD Minimum Antiterrorism Standards for Buildings." Whole Building Design Guide, 2018. <http://www.wbdg.org/ffc/dod>.
- Department of Defense. "DoD Security Engineering Facilities Planning Manual." Whole Building Design Guide, 2008. <http://dod.wbdg.org/>.
- Department of Defense. "Installation Master Planning with Change 1." Whole Building Design Guide, 2012. <http://dod.wbdg.org/>.

Department of Defense. “Unified Facilities Criteria (UFC).” Whole Building Design Guide. <http://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc>.

“DoD Instruction 2000.16.” Accessed November 20, 2024. https://fas.org/irp/doddir/dod/i2000_16p.htm.

Essex, Stephen, and Richard Yarwood. 2017. “Changing Places: The Armed Forces, Post-Military Space and Urban Change in Plymouth, UK.” *Geography* 102 (3): 122–31.

Ewing, Reid, and Robert Cervero. “Travel and the Built Environment.” *Journal of the American Planning Association* 76, no. 3 (June 2010): 265–294. <https://doi.org/10.1080/01944361003766766>.

Fenner, Andrew S, and Daniel (Daniel Benjamin) Abramson. 2019. “Walkability and Anti-Terrorism/Force Protection: Understanding the Relationship and How It Can Work on the United States Air Force’s Main Operating Bases.” Seattle: [University of Washington Libraries].

Flemmen, Magne, Vegard Jarness, and Lennart Rosenlund. 2018. “Social Space and Cultural Class Divisions: The Forms of Capital and Contemporary Lifestyle Differentiation.” *The British Journal of Sociology* 69 (1): 124–53. <https://doi.org/10.1111/1468-4446.12295>.

Forsyth, Ann. 2015. “What Is a Walkable Place? The Walkability Debate in Urban Design.” *Urban Design International* 20 (4): 274–92. <https://doi.org/10.1057/udi.2015.22>.

“Gms-Mcc-Final-Tsg-Plan-w-Letter-2017.Pdf | Powered by Box.” n.d. Accessed August 20, 2024. <https://deptofcommerce.app.box.com/s/kwyrvx4wkoqh83pa3okjd8zp12lozwx3>.

Hallinan, Lauren, and Bishop, Catherine. (1995). Military Base Closures and Reuse Planning: Representing the Poor. *Clearinghouse Review*, 28(12), 1339-356.

Hultquist, Andy, and Tricia L. Petras. (2012). An Examination of the Local Economic Impacts of Military Base Closures. *Economic Development Quarterly* 26(2), 151-161. doi: 10.1177/0891242412442374.

Ham, Charlotte, John B. Loomis, and Patricia A. Champ. 2015. “Relative Economic Values of Open Space Provided by National Forest and Military Lands to Surrounding Communities.” *Growth and Change* 46 (1): 81–96. <https://doi.org/10.1111/grow.12072>.

Hansen, Kenneth N., Tracy A. Skopek, and Mark Somma. 1997. “The Fundamentals of Local Policy Implementation In Military Base Redevelopment.” *The American Review of Public Administration* 27 (4): 377–97. <https://doi.org/10.1177/027507409702700405>.

Hansen, Kenneth N., and Theodore J. Stumm. 2006. “Reinvesting Government: Financing Options for Military Base Redevelopment.” *American Review of Politics* 26 (January):405–23. <https://doi.org/10.15763/issn.2374-7781.2005-2006.26.0.405-423>.

- Harmon, Brendan, W. Goran, and Russell Harmon. 2014. "Sustainable Cities and Military Installations in the Twenty-First Century: Towards Sustainable Military Installations and Adaptable Cities." In, 21–47. https://doi.org/10.1007/978-94-007-7161-1_2.
- "Healthy Base Initiative: Executive Summary," 2014. <https://www.militaryonesource.mil/health-wellness/healthy-living/healthy-base-initiative>
- Hill, Catherine. 2000. "Measuring Success in the Redevelopment of Former Military Bases: Evidence from a Case Study of the Truman Annex in Key West, Florida." *Economic Development Quarterly* 14 (3): 267–77. <https://doi.org/10.1177/089124240001400306>.
- Hill, Catherine Alison. n.d. "The Political Economy of Military Base Redevelopment: An Evaluation of Four Converted Naval Bases." Ph.D., United States -- New Jersey: Rutgers The State University of New Jersey, School of Graduate Studies. Accessed July 29, 2024. <https://www.proquest.com/docview/304451128/abstract?parentSessionId=dFzNUQ4c79Np32UuJJTgDyljmfzUsWOS7C0RXwtfJU%3D&sourcetype=Dissertations%20&%20Theses>.
- Institute for National Strategic Studies. (2015). Defense Partnerships: Documenting Trends and Emerging Topics for Action. National Defense University. *Defense Horizons*, 78. Retrieved from <https://apps.dtic.mil/dtic/tr/fulltext/u2/a622066.pdf>.
- Jacobs, Jane. 1961. *The Death and Life of Great American Cities*. New York: Vintage Books.
- Karim, Dewan. n.d. "Narrower Lanes, Safer Streets (Accepted Paper for CITE Conference Regina, June 2015)." Accessed August 20, 2024. https://www.academia.edu/12488747/Narrower_Lanes_Safer_Streets_Accepted_Paper_for_CITE_Conference_Regina_June_2015_.
- Keddy, Jim. 2001. "Bowling Alone: The Collapse and Revival of American Community (Review)." *Spiritus: A Journal of Christian Spirituality* 1 (1): 132–35.
- Kitsap Economic Development Alliance. (2018). Kitsap is a Leader in State's and Nation's Defense Industry. Retrieved from <http://kitsapeda.org/key-industries/defense/>.
- Lachman, Beth, Susan Resetar, and Frank Camm. 2016. *Military Installation Public-to-Public Partnerships: Lessons from Past and Current Experiences*. RAND Corporation. <https://doi.org/10.7249/RR1419>.
- Larice, Michael, and Elizabeth Macdonald, eds. *The Urban Design Reader*. 2nd ed. London: Routledge, 2013.
- Laurian, Lucie. 2007. "Deliberative Planning through Citizen Advisory Boards: Five Case Studies from Military and Civilian Environmental Cleanups." *Journal of Planning Education and Research* 26 (4): 415–34. <https://doi.org/10.1177/0739456X06298819>.

- Light, Jennifer S. 2004. "Urban Planning and Defense Planning, Past and Future." *Journal of the American Planning Association* 70 (4): 399–410.
<https://doi.org/10.1080/01944360408976390>.
- Lo, Ria Hutabarat. 2009. "Walkability: What Is It?" *Journal of Urbanism: International Research on Placemaking and Urban Sustainability* 2 (2): 145–66.
<https://doi.org/10.1080/17549170903092867>.
- Los Angeles County. "Model Street Design Manual." Manual. Los Angeles County Department of Public Health, 2011.
http://modelstreetdesignmanual.com/model_street_design_manual.pdf.
- Lynch, Kevin. 1960. *The Image of the City*. Cambridge, MA: MIT Press.
- MAKERS Architecture and Urban Design, LLP, White & Smith, LLC, TranspoGroup & Community Attributes. (2015). *Joint Land Use Study: Naval Base Kitsap and Naval Magazine Indian Island*. Retrieved from
<http://compplan.kitsapgov.com/Pages/JLUS.aspx>.
- Martin, Bridget. 2018. "From Camp Town to International City: US Military Base Expansion and Local Development in Pyeongtaek, South Korea." *International Journal of Urban and Regional Research* 42 (6): 967–85. <https://doi.org/10.1111/1468-2427.12698>.
- McClary, Daryl C. (2011). Puget Sound Naval Shipyard. *HistoryLink, Essay 5579*. Retrieved from <https://historylink.org/File/5579>.
- Meadows, Sarah O., Laura L. Miller, Jeremy N. V. Miles, Gabriella C. Gonzalez, and Brandon T. Dues. 2013. "Exploring the Association Between Military Base Neighborhood Characteristics and Soldiers' and Airmen's Outcomes." RAND Corporation.
https://www.rand.org/pubs/technical_reports/TR1234.html.
- Mehta, V. (2022). *Public Space: notes on why it matters, what we should know, and how to realize its potential* (1st ed.). Routledge. <https://doi.org/10.4324/9781003230502>
- "Mixed-Use Development Finds a Better Blend | Professional Builder." Accessed December 10, 2024. <https://www.probuilder.com/mixed-use-development-finds-better-blend>
- Morrison, Geoffrey Michael. 2011. "The Driving Culture of the U.S. Military." M.S., United States -- California: University of California, Davis.
<https://www.proquest.com/docview/936920752/abstract/473FF966C574A8EPQ/1>.
- Municipal Research and Services Center. (2019). Periodic Update Process for Comprehensive Plans and Development Regulations. Retrieved from <http://mrsc.org/Home/Explore-Topics/Planning/General-Planning-and-Growth-Management/GMA-Plan-Development-Regulations-Updates.aspx>.

- Nailor, Tina Anne. 2022. "THE IMPACTS OF FORMER MILITARY BASES ON THE URBAN GEOGRAPHIES: UNCOVERING THE SOCIAL MEANING OF URBAN SPACE BEYOND THE BROWNFIELD SURFACE". *GlobalHonorsTheses*. 88. https://digitalcommons.tacoma.uw.edu/gh_theses/88
- National Complete Streets Coalition. "Complete Streets Help Create Livable Communities." Smart Growth America, n.d. www.smartgrowthamerica.org/completestreets.
- National Crime Prevention Council of Singapore. "Crime Prevention Through Environmental Design Guidebook." National Crime Prevention Council of Singapore, 2003. www.ncpc.gov.sg.
- National Institute of Building Sciences. (2018). *Unified Facilities Code 2-100-01: Installation Master Planning, with Change 1*. Retrieved from <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-2-100-01>.
- Padley, Michelle Eirini. 2024. "Military Pasts, City Futures: The Transition of Brooks, San Antonio From Military Base to Urban Hub." Ph.D., United States -- North Carolina: The University of North Carolina at Chapel Hill. <https://www.proquest.com/docview/3056568697/abstract?parentSessionId=bsvxRrk4RXg00W1b%2F1Hcvlo%2BEwfOAXF4Xu6bJyJmw0k%3D&sourcetype=Dissertations%20&%20Theses>.
- Perkov, Kristina, and Tihomir Jukic. 2023. "HISTORICAL DEVELOPMENT OF MILITARY SITES AND THEIR IMPACT ON URBAN AND RURAL LAND USE IN THE EUROPEAN CONTEXT: EXPLORING THE SOCIAL CONTEXT AND SPATIAL FOOTPRINT." *Prostor* 31 (2): COV9–COV9. [https://doi.org/10.31522/p.31.2\(66\).9](https://doi.org/10.31522/p.31.2(66).9).
- Poppert, Patrick E., and Henry W. Herzog Jr. 2003. "Force Reduction, Base Closure, and the Indirect Effects of Military Installations on Local Employment Growth." *Journal of Regional Science* 43 (3): 459–82. <https://doi.org/10.1111/1467-9787.00307>.
- "PowerHouse Growers | 'CPTED': Designing the Way to Safer Communities." Accessed December 30, 2024. <http://www.powerhousegrowers.com/cpted-designing-the-way-to-safer-communities/>
- Puget Sound Regional Council. (2017). *Amazing Place: Growing Jobs and Opportunity in the Central Puget Sound Region*. Retrieved from <https://www.psrc.org/sites/default/files/amazingplacestrategy.pdf>.
- Puget Sound Regional Council. (2018) *Regional Centers Framework*. Retrieved from https://www.psrc.org/sites/default/files/final_regional_centers_framework_march_22_version.pdf.

- Puget Sound Regional Council. (2019). *Vision 2050: A Plan for the Central Puget Sound Region (Draft)*. Retrieved from <https://www.psrc.org/sites/default/files/draft-vision2050-plan.pdf>.
- RAND National Defense Research Institute. (2007). *The Thin Green Line: An Assessment of DoD's Readiness and Environmental Protection Initiative to Buffer Installation Encroachment*. By Lachman, Beth E., Anny Wong, & Susan Resetar. Retrieved from https://www.rand.org/pubs/research_briefs/RB9260/index1.html
- Reilly, Chandler S., and Christopher J. Coyne. 2024. "The Political Economy of Military Base Redevelopment." *Eastern Economic Journal*, June. <https://doi.org/10.1057/s41302-024-00277-2>.
- Reynald, Danielle. "Translating CPTED into Crime Preventive Action: A Critical Examination of CPTED as a Tool for Active Guardianship." *European Journal on Criminal Policy and Research* 17, no. 1 (2011): 69–81.
- Sbaraini, A., Carter, S.M., Evans, R.W. *et al.* How to do a grounded theory study: a worked example of a study of dental practices. *BMC Med Res Methodol* 11, 128 (2011). <https://doi.org/10.1186/1471-2288-11-128>.
- South Sound Military and Communities Partnership. 2019. "SSMCP Vision." <https://cityoflakewood.us/south-sound-military-and-communities-partnership/>.
- Spanu, Giacomo. 2023. "Urban Military Geographies: New Directions in the (Re)Production of Space, Militarism, and the Urban." *Geography Compass* 17 (12): e12727. <https://doi.org/10.1111/gec3.12727>.
- Speck, Jeff. *Walkable City Rules: 101 Steps to Making Better Places*. Island Press, 2018.
- Spectrum Group. *Civilian-Military Land Use Study*. (2016). Retrieved from <http://www.commerce.wa.gov/wp-content/uploads/2017/03/Commerce-Civilian-Military-Land-Use-2016.pdf>.
- Spectrum Group. (2017). *Washington State Military and Community Compatibility Strategy*. Retrieved from <https://deptofcommerce.app.box.com/s/kwyrvx4wkoqh83pa3okjd8zp12lozwx3>.
- The National Capital Planning Commission. "The National Capital Urban Design and Security Plan." Washington, DC: The National Capital Planning Commission, 2004. www.ncpc.gov.
- The William D. Ruckelshaus Center. (2019). *A Road Map to Washington's Future: Final Report Volume 1*. Retrieved from https://s3.wp.wsu.edu/uploads/sites/2180/2019/07/A-Road-Map-to-Washingtons-Future_Final-Report_6.30.19-1.pdf.

- “UFC 2-100-01 Installation Master Planning, with Change 1 | WBDG - Whole Building Design Guide.” 2012, 91. Accessed August 20, 2024. <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-2-100-01>.
- “UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings,” Whole Building Design Guide. 2018, 91.
- “UFC 4-020-01 DoD Security Engineering Facilities Planning Manual,” Whole Building Design Guide. 2008, 321.
- United States Census Bureau. (2018). Bremerton, WA Population Estimate. Retrieved from <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>.
- United States Census Bureau. (2018). Kitsap County, WA Population Estimate. Retrieved from <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>.
- United States. Department of Defense. (2016). *DoD Instruction 4715.24: The Readiness and Environmental Protection Integration (REPI) Program and Encroachment Management*. Retrieved from https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/471524_dodi_2016.pdf.
- United States. Department of Defense. (2018). *DoD Instruction 3030.03: Joint Land Use Study Program, Incorporating Change 1*. Retrieved from <https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/303003p.pdf?ver=2018-10-05-072003-127>.
- United States. Department of Defense. (2018). *DoD Instruction 4165.70: Real Property Management*. Retrieved from https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/471524_dodi_2016.pdf.
- United States. Department of Defense. (2018). *DoD Instruction 4715.03: Natural Resources Conservation Program*. Retrieved from <https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/471503p.pdf>.
- United States. Department of Defense. (2019). *Readiness and Environmental Protection Integration (REPI) Reports to Congress*. Retrieved from <https://www.repi.mil/Resources/Reports-and-Fact-Sheets/>.
- United States. Department of the Navy. Commander Navy Installations Command. (n.d.). Naval Base Kitsap: About Us. Retrieved from https://www.cnic.navy.mil/regions/cnrnw/installations/navbase_kitsap/about.html.
- Vukotich, George, Jamil D Bayram, & Miriam I Miller. (2012). Prairie North: A Joint Civilian/military Mass Casualty Exercise Highlights the Role of the National Guard in

- Community Disaster Response. *American Journal of Disaster Medicine*, 7(1), 65-72. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/22649870>.
- Washington State. Department of Commerce. (2019). *Washington State Guidebook on Military & Community Compatibility*. Retrieved from <https://deptofcommerce.app.box.com/s/ccvku9omtj20le4zzkum4fesvh0mv49>.
- Washington State. Employment Security Department. (2019). Kitsap County Profile. Retrieved from <https://esd.wa.gov/labormarketinfo/county-profiles/kitsap>.
- University of Mostar, Study of Geography, Faculty of Science and Education, Matice hrvatske bb, 88 000 Mostar, Bosnia and Herzegovina, Snježana Musa, Dario Šakić, and University of Mostar, Study of Geography, Faculty of Science and Education, Matice hrvatske bb, 88 000 Mostar, Bosnia and Herzegovina. 2019. "MILITARY BROWNFIELDS – POTENTIAL FOR TOURIST REVITALIZATION IN BOSNIA AND HERZEGOVINA." *GeoJournal of Tourism and Geosites* 26 (3): 1021–32. <https://doi.org/10.30892/gtg.26326-414>.
- Urban, Angela, Avinash Srivastava, Alexander Zhivov, Elizabeth Keysar, Calum Thompson, Kathleen Judd, and Michael Case. 2020. "Energy Master Planning for Resilient Public Communities--Best Practices from U.S. Military Installations." *ASHRAE Transactions* 126 (1): 828–49.
- "Walkable London: A Pedestrian Zone Called London." n.d. Topos Magazine. Accessed August 20, 2024. <https://toposmagazine.com/walkable-london-a-pedestrian-zone-called-london/>.
- www.goldenshovelagency.com, Golden Shovel Agency. n.d. "Defense Industry in Kitsap County, WA." Accessed August 20, 2024. <https://www.kitsapeda.org/key-industries/defense>.
- Young, Frank W. 2001. "Putnam's Challenge to Community Sociology: Bowling Alone: The Collapse and Revival of American Community, by Robert D. Putnam." *Rural Sociology* 66 (3): 468–468. <https://doi.org/10.1111/j.1549-0831.2001.tb00079.x>.