AGENDA

MEETING: Regular Meeting
TIME: Wednesday, December 19, 2018, 5:00 p.m.
LOCATION: Room 16, Tacoma Municipal Building North
37 Market Street, Tacoma, WA 98402

A. Call to Order and Quorum Call

B. Approval of Agenda and Minutes
   • Minutes – none

C. Public Comments
   • Comments are accepted on all discussion items, and are limited to 3 minutes per person.

D. Discussion Items

1. JBLM Airport Compatibility Overlay District
   • Description: Review oral testimony received at the public hearing on November 7, 2018
     and written comments received through November 9, 2018; and consider
     appropriate modifications to the proposed code amendments.
   • Action: Guidance
   • Staff Contact: Larry Harala, 253-591-5845, lharala@cityoftacoma.org

2. Future Land Use Map (FLUM) Implementation
   • Description: Review an addendum to the Options Analysis provided on September 19
     addressing two issues: Transitional Zoning Districts in the Multifamily Low-
     Density land use designation, and acknowledgement of Puyallup Tribal
     jurisdiction over certain properties within the scope of work (This is an
     application of the 2019 Amendment).
   • Action: Guidance
   • Staff Contact: Stephen Atkinson, 253-591-5531, satkinson@cityoftacoma.org

3. Planning Commission Year-End Review
   • Description: Review the progress of implementation of the Planning Commission Work
     Program 2018-2020; and discuss issues of interest concerning the
     Commission’s conduct of business.
   • Action: Guidance
   • Staff Contact: Brian Boudet, 253-573-2389, bboudet@cityoftacoma.org

(Continued on the Back)
E. Communication Items

(1) **Applications for 2020 Amendment** – The Planning Commission will accept applications for the 2020 Amendment to the One Tacoma Comprehensive Plan and/or the Land Use Regulatory Code. The project timeline for the 2020 Amendment is from July 2019 to June 2020. In order to be considered for potential inclusion in the 2020 Amendment process, applications must be submitted between January 1 and April 1, 2019. To submit an application, please visit [www.cityoftacoma.org/2020Amendment](http://www.cityoftacoma.org/2020Amendment).

(2) **The Planning Commission’s meeting on January 2, 2019 has been canceled.** The next regularly scheduled meeting is on Wednesday, January 16, 2019, at 5:00 p.m., in the Council Chambers (changed from Room 16); tentative agenda (subject to change) includes: JBLM Airport Compatibility Overlay District; Historic Preservation Code Improvements; and 2019 Annual Amendments – Minor Amendments.

(3) **The Infrastructure, Planning and Sustainability Committee’s meeting on December 26, 2018 has been canceled.** The next regularly scheduled meeting is on Wednesday, January 9, 2019, at 4:30 p.m., in Room 16.

F. Adjournment
To: Planning Commission
From: Larry Harala, Associate Planner
Subject: JBLM Airport Compatibility Overlay District
Meeting Date: December 19th, 2018
Memo Date: December 12th, 2018

Action Requested:
Staff will be seeking further Commission direction pursuant to the proposed Airport Compatibility Overlay District and associated proposed TMC Title 13 code changes. The Commission conducted a Public Hearing on November 7th, 2018 at the STAR Center (3873 S 66th St).

Discussion:
At this meeting, the Commission will discuss key themes of the public comments received and identify potential updates to the draft proposals. The public review draft proposals largely reflect the JBLM Joint Land Use Study (JLUS) and U.S. Air Force’s Air Installations Compatible Use Zones (AICUZ) Program guidance. The Commission received comments both opposed to and supportive of the proposal, as well as questions regarding its rationale and likely effects.

Project Summary:
The City is considering creation of an Airport Compatibility Overlay District corresponding with the JBLM Accident Potential Zone (APZ) II in South Tacoma. The Overlay District would modify zoning and development standards to prevent further development that would be incompatible with aircraft safety risks, as recommended by the U.S. Air Force and JBLM Joint Land Use Study.

Prior Actions:
- June 20th, 2018 – the Commission reviewed this proposal as part of the 2019 Amendments scoping process and provided direction to move ahead on a separate, accelerated timeline.
- September 19th, 2018 – the Commission authorized the distribution of the proposals for public review and set a Public Hearing for November 7th, 2018.
- October 24th, 2018 – Staff held a community information meeting at the STAR Center.
- November 7th, 2018 – the Commission held a Public Hearing at the STAR Center.

Staff Contact:
Larry Harala, Associate Planner
lharala@cityoftacoma.org, 253-591-5845

Attachments:
1. JBLM Airport Compatibility Overlay District Overview
2. Key Issues Summary
3. Public Comments (compiled)

c: Peter Huffman, Director
JBLM Airport Compatibility Overlay District

Application: JBLM Joint Land Use Study – APZ II

Clear Zones and Accident Potential Zones (APZ) represent the most likely impact areas if an aircraft accident occurs. APZs are based on Department of Defense historical data on where accidents have previously occurred.

A small portion of South Tacoma is located within Joint Base Lewis McChord’s (JBLM) APZ II. Based on the elevated risk around aircraft safety, the JBLM JLUS Implementation Plan recommends that the City incorporate considerations in local planning and permitting processes to address the health and safety of residents.

A review of development standards and allowable uses is being conducted to ensure that appropriate measures are taken to limit design and land use decisions that unnecessarily elevate risks to the safety of people living or working in the APZ II.

<table>
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<tr>
<th>Project Summary</th>
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<tr>
<td><strong>Applicant:</strong></td>
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<td><strong>Location and Size of Area:</strong></td>
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<td><strong>Current Land Use and Zoning:</strong></td>
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<td><strong>Neighborhood Council Area:</strong></td>
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<td><strong>Staff Recommendation:</strong></td>
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<td><strong>Date of Report:</strong></td>
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<td><strong>Project Proposal:</strong></td>
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Area of Applicability

Joint Base Lewis-McChord: Accident Potential Zone II
Proposed Airport Compatibility Overlay District
PROPOSAL

Create an Airport Compatibility Overlay District corresponding with the JBLM Accident Potential Zone (APZ) II in South Tacoma, and make corresponding changes to land use tables and related sections of the Tacoma Municipal Code. The Overlay District will implement the recommendations of the JBLM Joint Land Use Study (JLUS) and the U.S. Air Force’s Air Installations Compatible Use Zones (AICUZ) Program, by instituting changes to permitted land uses and development standards.

INTENT

- Prevent development conditions that could interfere with aircraft operations
- Reduce risk to life and property in the incidence of a crash, through the following strategies
  - Prevent increases in densities and congregations of people; and,
  - Prevent development that includes highly flammable or explosive components
- Implement the City’s policies calling for collaboration and compatibility with JBLM Airfield
- Increase knowledge of aircraft accident risks
- Recognize existing uses and avoid undue impacts to residents, property owners, businesses and institutions

GENERAL PROVISIONS

- Notice: Notice on Title regarding the Overlay District is required for land use actions, for new construction, and for substantial alterations to existing structures
- Split parcels: The standards apply only to portions of parcels that lie within the Overlay
- Discretionary land use proposals (such as rezones, conditional uses, variances) must be consistent with the Overlay District intent

LAND USES

- The land use requirements of the underlying zoning districts apply within the Overlay District, except that the following land uses are Prohibited:
  - Residential
    - Single-family platting denser than 2 dwelling units per gross acre
    - Accessory Dwelling Units
    - Special Needs Housing (above 6 residents)
- Two-family, three-family, townhouse, multifamily, mobile home, student housing, mixed-use, or other development incorporating more than one dwelling unit
  - Commercial recreation
  - Cultural institutions
  - Day care centers (above 12 children)
  - Eating and drinking establishments (and similar uses)
  - Hospitals/Medical Offices
  - Hotels/motels
  - Parks, recreation and open space uses requiring a Conditional Use Permit
  - Public assembly/theaters
  - Religious assembly
  - Shopping centers
  - Schools
  - Utilities (overhead transmission or distribution lines)
  - Wireless Facilities - Levels 3 and 4 (limits height to 60 feet)

- **Existing residential uses**: Lawfully existing residential uses (at the time of Overlay District adoption) which do not meet its provisions are Permitted and may be modified, provided there is no increase in the number of dwellings

- **Existing non-residential uses**: Other lawfully existing uses (at the time of adoption) which do not meet its provisions are Non-conforming, and subject to the following limitations
  - Meet the City’s Nonconforming Uses standards
  - No increase in occupancy capacity (e.g., students, occupants, congregants)
  - Minor modifications to existing discretionary land use permits are allowed, but Major Modifications require compliance with the new standards

**DEVELOPMENT STANDARDS**

- The following characteristics, when proposed as part of any development, are not allowed in the Overlay District
  - Generation of air pollution, electronic interference or glare that could negatively affect pilots or aircraft
  - Structures taller than allowed in the base zoning districts
  - Manufacturing or processing of apparel, chemicals, petroleum, rubber or plastic

- The following land uses shall be subject to **Floor Area Ratio** limitations as specified
  - Commercial: 0.28
  - Office and Personal Services: 0.22
  - Industrial: 0.56
  - Warehouse/storage: 2.0

Three examples of FAR = 1.0
**Airport Compatibility Overlay District (JLUS)**

**Key Issues Summary – December 19, 2018**

This table summarizes the comments and inquiries received during the public comment period and outlines policy options for the Commission’s consideration. The comments are generally sorted into categories based on the key components of the proposed Overlay District. In addition, the Commission has received comments from JBLM, the South Sound Military Community Partnership (SSMCP), and the City of Lakewood in support of adopting standards to address the APZ II in Tacoma.

<table>
<thead>
<tr>
<th>TOPICS</th>
<th>POLICY OPTIONS</th>
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<tbody>
<tr>
<td><strong>LAND USES RESTRICTIONS</strong></td>
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<tr>
<td>The proposal prohibits a list of land uses based on the AICUZ recommendations.</td>
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<tr>
<th>RESIDENTIAL Land Uses</th>
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<td>The proposal would generally restrict new development to a density to 2 units per acre or less. Existing residential uses could expand but would not be allowed to add new dwelling units. Accessory Dwelling Units (ADU’s) would be prohibited.</td>
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**ISSUES & COMMENTS:**
- Negative impacts to property values and the ability to get homeowners’ insurance and bank loans
- The proposal would not make current residents safer
- Since the area is nearly fully built-out, restrictions would result in little benefit in terms of safety
- The most significant impacts would primarily be on a small number of undeveloped properties
- The number of potential ADU’s is not significant in terms of increasing density

**POLICY OPTIONS:**
- The underlying principle is to prevent significant increases in density. However, the AICUZ and JLUS recognize that local circumstances must be taken into account in crafting the appropriate regulatory approach.
- Given that the neighborhood is largely built-out, the potential increase in residential density is not substantial. In light of the concerns raised, the Commission could consider modifying the proposal to provide additional flexibility by maintaining existing development standards and requirements consistent with the rest of the City of Tacoma for Single Family properties.

**COMMERCIAL Land Uses**

The proposal would prohibit certain commercial and office land uses with the aim of keeping activity at less than 50 people per acre, and would impose Floor Area Ratio (FAR) maximums of 0.28 for Commercial and 0.22 for Office land uses.

**ISSUES & COMMENTS:**
- Possible impact to property values

**POLICY OPTIONS:**
- The primary policy objective is to prevent large-scale gatherings of people in the APZ II, while balancing the safety benefits with the needs of the neighborhood. The AICUZ and JLUS recognize that local circumstances must be taken into account in crafting the appropriate regulatory approach. It is staff’s assumption that the AICUZ recommendations are based on the concept of larger versions of these land uses. Therefore, it may be possible to meet the intent while allowing some smaller-scale uses which would otherwise be prohibited.
### TOPICS

- The proposal would limit neighborhood-serving commercial establishments
- Restrictions seem unlikely to significantly reduce the number of people in the area

### POLICY OPTIONS

**POLICY OPTIONS:**
The Commission could modify the proposals as follows:
- Allow small-scale, neighborhood commercial uses outright (e.g., eating and drinking establishments up to a certain maximum size)
- Simplify the approach by replacing the Floor Area Ratio (FAR) maximums with square footage maximums
- Introduce an option to propose development of restricted uses that could meet the intent of the Overlay District through a variance or CUP process

### PUBLIC ASSEMBLY Land Uses

The proposal would prohibit land uses involving public assemblage, such as schools, churches and commercial recreation.

**ISSUES & COMMENTS:**
- Comments reflect a general agreement that large gatherings are not advisable, and that uses including schools and large daycare centers are not appropriate in the APZ II
- Concerns about the negative impact on future use and value of properties
- Concerns about the loss of important neighborhood gathering places
- Concerns about limitations on existing uses, such as minor expansions for accessory uses within the skate rink

Since public assembly uses by definition create large congregations of people, the AICUZ considers them to be incompatible with the APZ II. The AICUZ seeks to generally restrict activity to a level below 50 persons per acre. Staff recognize that public assembly uses are an important part of complete neighborhoods, but nonetheless recommend that the proposed prohibitions be retained. However, some modifications could be considered.

**POLICY OPTIONS:**
The Commission could consider the following options, which would need to be further explored:
- Seek to identify whether there are small-scale versions of these uses that would permanently maintain a less than 50 persons per acre level of activity
- Introduce an option to propose specific uses that could meet the intent of the Overlay District through a variance or CUP process

### UTILITIES and WIRELESS Land Uses

The current proposal prohibits overhead utilities and wireless facilities over 60 feet in height.

**ISSUES & COMMENTS:**
- Staff have identified potential issues for discussion

The AICUZ’s primary basis for restricting overhead utilities and wireless facilities is to prevent collisions with aircraft and/or to reduce the potential for distractions to pilots. In further conversation with JBLM and JLUS staff, it would seem that in this portion of JBLM’s APZ II, given the distance from the runway, only structures substantially taller than would be allowed under existing zoning would cause concerns. In addition, the proposal contains a separate provision limiting height to the maximum height of the underlying zoning district.

**POLICY OPTIONS:**
The Commission could consider modifying the proposal as follows:
- Remove or modify restrictions on Wireless Facilities and overhead Utility facilities
- Simplify the proposed height limitation within the Overlay District
<table>
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<tr>
<th>TOPICS</th>
<th>POLICY OPTIONS</th>
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<tr>
<td><strong>INDUSTRIAL Land Uses</strong>&lt;br&gt;The proposal prohibits heavy industry and places a Floor Area Ratio (FAR) limitation of 0.56 on industrial, and of 2.0 on warehouse/storage.</td>
<td>The AICUZ proposes some restrictions on industrial uses based on the potential for large congregations of people, and on potential concerns, in the instance of an airplane crash, with hazardous materials and chemicals. Given current zoning, this is not a major issue in this area. However, there may be some options to further fine tune the proposal to retain flexibility for the future use of property.</td>
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<td><strong>ISSUES &amp; COMMENTS:</strong>&lt;br&gt;• Staff have identified potential issues for discussion</td>
<td><strong>POLICY OPTIONS:</strong>&lt;br&gt;The Commission could consider modifying the proposal as follows:&lt;br&gt;• Simplify the approach by replacing the Floor Area Ratio (FAR) maximums with square footage maximums&lt;br&gt;• Introduce an option to propose specific uses that would meet the intent of the Overlay District through a variance or CUP process&lt;br&gt;• Consider clarifying how expansions involving an accessory use (such as a dining area within a warehouse) would be reviewed in the Overlay District</td>
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<thead>
<tr>
<th>DEVELOPMENT STANDARDS</th>
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<tr>
<td>The proposal would prohibit the following characteristics, when proposed as part of any development:</td>
<td>These standards were included with the intent of reducing the likelihood of a crash, and reducing the potential danger should one occur.</td>
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<tr>
<td>• Generation of air pollution, electronic interference or glare that could negatively affect pilots or aircraft&lt;br&gt;• Structures taller than allowed in the base zoning districts&lt;br&gt;• Manufacturing or processing of apparel, chemicals, petroleum, rubber or plastic</td>
<td>Staff note that these are broad categories, and that in some cases some of these features could be consistent with the intent of the Overlay District.</td>
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<td><strong>POLICY OPTIONS:</strong>&lt;br&gt;The Commission could consider modifying the proposal as follows:&lt;br&gt;• Allow for a staff determination, potentially in consultation with JBLM, on proposals including these features</td>
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Joint Land Use Study
Airport Compatibility Overlay District

Proposed Amendments to Tacoma Municipal Code

Public Comments
and Staff Response

Received by
The Planning Commission

December 19th, 2018

City of Tacoma
Planning & Development Services Department
Planning Services Division
747 Market Street, Room 345
Tacoma, WA 98402-3793
(253) 591-5030
www.cityoftacoma.org/planning
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A. Approved Minutes from the November 7th, 2018 Planning Commission Meeting

B. Oral Testimony Received at the Public Hearing on November 7th, 2018
(Listed in the order of sign-up for testifying)

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<tr>
<th>No.</th>
<th>Name</th>
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<tbody>
<tr>
<td>1</td>
<td>Bill Adamson – Director, South Sound Military and Communities Partnership (SSMCP)</td>
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<td>2</td>
<td>Rie Suzuki</td>
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<td>3</td>
<td>Courtney Brunell – Planning Manager City of Lakewood</td>
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<td>4</td>
<td>Barbara Hopkins</td>
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<td>5</td>
<td>Betsy Elgar</td>
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<td>6</td>
<td>Bill Dixon</td>
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<td>7</td>
<td>Scott Grover</td>
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<td>8</td>
<td>Jeff Hannem</td>
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<td>9</td>
<td>Jeff Nolta</td>
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<td>10</td>
<td>Rick Rosenbladt</td>
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<td>11</td>
<td>Venus Dergan</td>
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<td>12</td>
<td>Carolyn Hannemon</td>
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<td>13</td>
<td>Pamela Nugent</td>
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C. Written Comments Received through November 9th, 2018

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<th>No.</th>
<th>Organization/Name</th>
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<td>1</td>
<td>Joint Base Lewis-McChord</td>
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<tr>
<td>2</td>
<td>South Sound Military and Communities Partnership</td>
<td>10</td>
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<tr>
<td>3</td>
<td>City of Lakewood</td>
<td>11-12</td>
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<tr>
<td>4</td>
<td>Christian Briseño</td>
<td>13</td>
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<tr>
<td>5</td>
<td>Jeff Nolta</td>
<td>14</td>
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<tr>
<td>6</td>
<td>Tami Welch</td>
<td>15</td>
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D. Staff Response to Public Comment
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E. Staff Response to Planning Commission Questions
Pages 18-22

F. Appendices – Supporting information and articles

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<td>Military Times Mishaps and Accidents Article</td>
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<td>Virginia Beach, Virginia. (Oceana Naval Airbase) Masterplan</td>
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<tr>
<td>JLUS – Executive Summary and Aircraft Safety Sections</td>
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<tr>
<td>Tacoma Neighborhood Element (2004-2014)</td>
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Chair Wamback called the public hearing to order at 5:45 p.m. He reviewed the procedures for the public hearing, and asked the commissioners to introduce themselves.

Larry Harala, Planning Services Division, provided an overview of the subject of the hearing, which was the proposed Airport Compatibility Overlay District corresponding with the Joint Base Lewis McChord’s (JBLM) Accident Potential Zone II (APZ II). The intent of the proposal is to reduce risk where possible, increase awareness and decrease risk on the ground should a crash occur, while acknowledging the existing community.

Mr. Harala indicated that the proposal is compliant with the recommendations of the 2015 Joint Land Use Study (JLUS) and the U.S. Air Force’s Air Installations Compatible Use Zones Program. Key components of those recommendations are all uses resulting in congregation of less than 50 people per acre and residential densities at or below 2 units per acre. The proposal is designed to allow all the existing development to remain as it is, while public assembly uses would become legal non-conforming and subject to non-conforming standards in city code. In short non-conforming properties can be rebuilt in the event of a catastrophe and can effectively remain in perpetuity. New public assembly uses like schools, day care centers, churches, nightclubs would be prohibited. Certain industrial uses involving large congregations of employees or processing and storage of hazardous materials would be prohibited. Mr. Harala pointed out that there are few undeveloped properties in the area, but that they are all residential zoning and that any new development would be restricted to a maximum of 2 units per acre or 1 home per undeveloped lot on lots that are less than an acre.

Mr. Harala explained that there are three zones the Air Force has identified relating to aircraft accident potential – Clear Zone, Accident Potential Zone I and Accident Potential Zone II. The only designated area within the City of Tacoma is APZ II, while Clear Zone and APZ I are to the south of city limits. Of all the aircraft accidents around military bases, 5% occurred in the APZ II. Mr. Harala pointed out that should a large transport or tanker plane crash that the area of impact would be nearly 10 acres and the entire area is only approximately 200 acres.

In terms of land use conformity to the Air Force recommendations, Mr. Harala provided that generally the subject area is more compliant than areas in the APZ I and Clear Zone to the south, however the area is still somewhat out of compliance.
with Air Force recommendations. He explained that the area is primarily zoned R-2 and mostly single family in nature with some commercial properties along the South Tacoma Way side of the area and some industrial properties to the southeast quadrant of the area. There are some public assembly uses like churches and Arlington Elementary School in the area.

Mr. Harala also reported on the public notification efforts as well as the generic and targeted outreach efforts, including a community meeting conducted on October 24, 2018 at the STAR Center (approximately 35 people in attendance). He quickly reviewed the questions and comments received at the community meeting.

Mr. Harala then introduced Bill Adamson of the South Sound Military and Communities Partnership (SSMCP), a key stakeholder of the project. Mr. Adamson commented that the SSMCP supports Tacoma’s effort in adopting the proposed Airport Compatibility Overlay District and that Lakewood is pursuing similar effort for APZ I. The Air Force has a zero tolerance policy for accident. Mr. Adamson mentioned the worst accident in terms of fatality (with 37 lives lost) occurred 66 years ago near South Tacoma Way and 84th, right on the border of APZ II and APZ I. He commented that there are three types of risk – risk to the public, operational flight risk, and risk to JBLM’s mission. JBLM is a major contributor to the regional economy, while being a completely urban, encroached installation. The Military has been working closely with the surrounding communities to minimize these risks. The JLUS is one of such efforts.

Chair Wambback called for testimony. The following citizens provided comments:

- Rie Suzuki – Ms. Suzuki has never considered that she has lived in a potential accident zone, until the last community meeting, and never heard that a plane may crash there. Many disasters can occur anywhere at any time, such as earthquakes, hurricanes, gas explosions, and mass shootings. She would like to ask the City of Tacoma to seek alternative solutions for these South Tacoma residents and the new public Arlington Elementary School built last year. She wanted to note that the Air Force can build the second runway in another area, as they have a large amount of space on base. However, it is necessary to change the zoning, standards, and restrictions in the future. The City needs to provide all information in the future to the citizens that are affected before it comes into the law. She also asked for the City to allow sufficient time for all the residents and property owners to be able to make plans or change of plans such as accessory dwelling unit applications, expansions, subdivisions and building applications.

- Courtney Brunell – Ms. Brunell is the planning manager for the City of Lakewood. Lakewood has adopted similar regulations to keep residents safe. She thanked the staff, and the Commission, and appreciated the effort to keep citizens safe.

- Barbara Hopkins – Ms. Hopkins purchased her house from HUD, and was not aware that it was in an APZ II. She noted that there is greasy fuel
residue on her porch, and sounds from the aircrafts are noticeable. She is concerned about the property restrictions will greatly affect her resale value and taxes. She is shocked that the Arlington Elementary School was allowed to be built. Apparently the safety of the children was not a priority. She believed the proposed action is too little too late, as the school is already built and people already live there. Her house has been there since 1910, and no plane has ever hit it. The proposed restrictions will only harm home owners.

- Betsy Elgar – Ms. Elgar expressed concerns about people living under fear of airplane crash and not being able to renovate their property. She suggested having a tour of the area before developing the land use and development regulations.

- Bill Dixon – Mr. Dixon was a firefighter in the early 1970s for JBLM. He’s more concerned for the private plane pilots. He’s familiar what happens when planes crash. He stated that the JBLM pilots fly all the time and know the area and monitor maps. They are flying at all hours of the day. He knew about the crash zone back in 1973-75, and was amazed that the school was allowed to be rebuilt. He doesn’t know what impact this will have and how that will affect taxes, insurance and resale value. He wanted to know if the City has talked with other cities and insurance companies. He wanted to know if people will be notified with any information from studies that may happen.

- Scott Grover – Mr. Grover owns multiple properties that are right next to each other. They knew they were in the flight path, but not in an accident potential zone. He and his wife bought the homes as an investment while he was in the Navy. He understands why the area wants to be rezoned for safety purposes. He found out that there are no accident potential zones at certain airports and feels it is unjust to place restrictions on home owners in this area and ignore this for over 40 years. He noted this has nothing to do with keeping people safe and also stated that no projects within this zone and certain distance from the airfield can receive HUD funds. With no HUD funds available, where is anyone going to be able to borrow money to buy the property when people are ready to sell? He asked what is going to happen to Fannie May and Freddie Mack, who are also regulated by HUD. He believed this will cause two things to occur – property value will go down, and insurance rates will go up.

- Jeff Hannem – Mr. Hannem is a realtor in Lakewood, who believed there will be somewhat of an impact from this overlay. He owns one property, and wanted to state that it wouldn’t make any sense to rebuild a 600 sq. ft. home if it burned down. It’s a very large lot, and not being able to add an ADU is a future loss for this property. He will probably sell his property in the area and will find out if there is an impact to the property value. He noted that anything that will spook a potential buyer should be shown in the title.
Although that’s not good for the realtor business, as a homeowner, he believed people should have the right to know what they are buying. He hoped that over the course of time that people could substantiate losses, as it sounds like this should have happened a long time ago. He noted it’s better late than never, but a lot of people have bought and invested in this area.

- Jeff Nolta – Mr. Nolta wanted to talk about three things – risk, mitigation, and property values and rights. He noted that, historically since 1968, the crash risk to the APZ II is 5%, but 32% (which is 6 times as high) within 10 nautical miles of the APZ II. He asked, so what are we going to do with the rest of Tacoma that has a far greater incidences of crashes than the APZ II which should change a lot of what is being proposed here. As far as mitigation, he commented that the chance to mitigate this was in the 1940’s when they built McChord. For whatever reason they chose to build it on the far northern end of the base with virtually no other property to have any clearing for APZ zones, so it’s too late for that. He commented that there is only about 2.5% of the APZ II that is unbuilt. He believed that the cities’ opportunity to mitigate is gone, as the area is completely built up. We’re not going to change the density here unless you’ll take steps to move people out.

- Venus Dergan – Ms. Dergan commented that realtors don’t have to divulge information about the APZ zoning right now, and wondered if they will have to divulge this information in the future. She commented that residents are concerned about insurance. She stated that we all live in an earthquake zone, but not all of us have earthquake insurance – will insurance be voluntary?

- Carolyn Hannemon – Ms. Hannemon commented that because the APZ is not a new development why we are just now imposing this. It’s not going to impact the City. It will impact the people. She noted that the City could’ve taken action back in 2005 during a study that was conducted. It clearly would’ve come up then, so why is the City trying to put a band aide over this – because it will not impact the City, it will impact the people. She asked, why was the new building of the Arlington Elementary allowed? Property values and insurance values, and the children who live here – all things long term – are being affected. This will harm the citizens wellbeing in this area, but won’t affect the City.

- Pamela Nugent – Ms. Nugent agreed with the people. She had been wanting to open up a homeless shelter on her property to serve the Lord. English is not her first language. The restrictions from the zoning overlay crushed her dream. She has been helping people who have been sleeping on the streets. If she cannot be allowed to do what she wants, she wants the City to provide relocation services if she cannot build more on her property to help the homeless.
With no more citizens coming forward to testify, Chair Wamback announced that the Commission will continue to accept written testimony until November 9th and closed the public hearing at 6:36 p.m. He asked Commissioners to provide feedback as to what additional information the Commissioners would like staff to provide at the next meeting.

- Commissioner Edmonds requested for clarifications on whether APZ zones are designated by the Air Force, how long they have been in place, whether the City is required to disclose that information, how insurance is affected, whether staff would be able to gather more recent incidents data than 23 years ago, what the City of Lakewood has done with APZ I, and how many residents and lots the City will be affecting with the proposed overlay district.

- Commissioner Waller asked how many times in the past have we attempted to officially rezone this area. Mr. Harala answered that to his knowledge the City hasn’t so far, although he is certain that it has come up in the past, but not to this extent about a discussion to create an overlay district. He will provide additional information for the next meeting.

- Commissioner Givens commented that his biggest concern is to guard against future slum and blight. He wanted to get an insurance and lenders opinion. He wanted to know what other urban areas, older urban areas have done, and wanted to know about the SEPA determination for the Arlington Elementary School. He is curious as to how the school district responded to a lot of the questions on the check list, and that will help him follow their thought pattern.

- Commissioner Strobel was curious about the coordination among JBLM, the City and the City of Lakewood. Mr. Harala pointed out LT. Colonel Kevin is present, who also attended the community meeting on October 24th. Mr. Harala noted that the City of Tacoma is actually a little ahead in a process to follow up on the 2015 JLUS. The base is working with a consultant on this very issue, as well the City of Lakewood. Tacoma is about a year ahead.

- Commissioner McInnis asked that perhaps Lt. Colonel could help us understand what other communities have done, and how they have dealt with this issue.

- Commissioner Edmonds asked if there is a way to incorporate some kind of relocation incentive if people want to relocate from the actions of the City. She also asked if staff have talked to the school district about the elementary school, and why it was allowed to be rebuilt. Mr. Harala answered that it’s his understanding that when Arlington was remodeled, this was addressed, and that he will provide more information at the next meeting.

- Chair Wamback commented that it’s his understanding that the federal government will not provide funding for subsidized housing through HUD in an APZ II zone. He is curious if that applies FA mortgages like Fanny May,
Freddie Mack, and what are the impacts. He noted that it would be useful to have more information on the public side of this process, or was it just agencies getting together to talk amongst themselves. To him, it sounds like this process has been going on for many years, yet what sort of approach was taken to distribute this information to the public. He understood the US Navy in the Hampton Road areas of southeastern Virginia has purchased easements from residential properties surrounding naval air installations. He asked is there any consideration by the Air Force or other federal agencies to treat the people of Tacoma equal to how they have treated people in other areas of the country, or are those programs no longer possible. He is disappointed that the US government didn’t come to testify in front of the people they represent. He would encourage staff to get the federal government on board to come and speak directly to them, instead of around them.

- Commissioner Edmonds wanted more perspective on how the land use of Tacoma will impact JBLM's mission.

In closing, Chair Wamback reiterated that the Commission will continue to accept written comments through November 9th. He suggested that those who already testified are welcome to submit additional comments and those who may not have felt comfortable speaking tonight are encouraged to submit comments.

(The meeting was recessed at 6:57 p.m., and resumed at 7:09 p.m.)
DEPARTMENT OF THE ARMY
JOINT BASE GARRISON HEADQUARTERS, JOINT BASE LEWIS-MCCHORD
1010 LIGGETT AVENUE, BOX 339500, MAIL STOP 1AA
JOINT BASE LEWIS-MCCHORD, WA 98433-9500

December 7, 2018

SUBJECT: Tacoma’s Proposed JBLM Airport Compatibility Overlay

City of Tacoma Planning Services
747 Market Street, Room 345
Tacoma, WA 98402

The purpose of this letter is to support the City of Tacoma’s actions to assess compliance and propose actions to align conditions in areas associated with JBLM McChord Field Clear Zone and Accident Potential Zones.

The consideration by the City of Tacoma to establish a Joint Base Lewis-McChord (JBLM) Airport Compatibility Overlay will be an extremely positive step. It will also synchronize with recommendations from the 2015 JBLM Air Installations Compatible Use Zone findings and recommendations (AICUZ). Tacoma’s proposed Overlay District will correspond with JBLM’s Accident Potential Zone (APZ) II and potentially modify zoning and development standards, thereby improving public safety and reducing flight risks during critical military flight operations from JBLM. JBLM supports Tacoma’s effort to create a JBLM Airport Compatibility Overlay.

The point of contact is the undersigned at thomas.g.knight.civ@mail.mil, or (253) 477-1005.

Sincerely,

Thomas G. Knight
Chief of Staff
Joint Base Lewis-McChord
16 October 2018

City of Tacoma
Planning Services
747 Market Street, Room 345
Tacoma, WA 98402

SUBJECT: Tacoma’s Proposed JBLM Airport Compatibility Overlay

The South Sound Military & Communities Partnership (SSMCP) focuses on the intersection of issues between local governments and the military community. The mission of the SSMCP is to foster effective communication, understanding, and mutual benefit by establishing the most effective point of coordination for resolution of those issues which transcend the specific interest of the military and civilian communities of the South Puget Sound Region. The cumulative support local communities provide military installations is critical to successful execution of their assigned military missions.

Tacoma is considering the creation of a Joint Base Lewis–McChord (JBLM) Airport Compatibility Overlay. This initiative is in keeping with the 2015 JBLM Air Installations Compatible Use Zone findings and recommendations (AICUZ). While it remains impractical to fully implement all the 2015 AICUZ recommendations, Tacoma's effort is a step in the right direction. The Overlay District corresponds with JBLM's Accident Potential Zone (APZ) II and modifies zoning and development standards. This initiative reflects Tacoma's commitment to make accommodations to improve public safety and reduce operational flight risks during military operations central to JBLM’s mission. **SSMCP members support Tacoma’s effort to create a JBLM Airport Compatibility Overlay.**

Thank you in advance for your favorable consideration.

Respectfully,

COL(R) WILLIAM G. ADAMSON, USA
Program Director
South Sound Military & Communities Partnership
October 31, 2018

Stephen Wambach, Chair  
Tacoma Planning Commission  
c/o Lihuang Wang  Senior Planner  
747 Market Street  
Tacoma, WA 98402

Dear Mr. Wambach:

This letter is to support the proposed Joint Based Lewis-McChord (JBLM) Overlay District in the City of Tacoma related to the Accident Potential Zone II (APZ II) for North McChord Airfield.

In order to ensure that Tacoma’s population is safe and simultaneously to protect continued operations at JBLM, enacting the Overlay District is needed. In May 2015, JBLM’s Air Installation Compatible Use Zone (AICUZ) Study Update was published. Its findings were incorporated within the 2015 Joint Land Use Study (JLUS) coordinated by the South Sound Military & Communities Partnership (SSMCP) (of which Tacoma is a member), on which the proposed Overlay District is based. Air Force Instruction afd2-7063 related to AICUZ programs was published in December 2015, and Tacoma’s staff reviewed the updated instruction when preparing the Overlay District proposal as well. The proposed Overlay District is well-reasoned, well-informed, and is wise planning by Tacoma.

JBLM is the second largest employer in Washington State, and an essential driver to the economic momentum of Washington State and the South Sound region. The South Sound region has supported its military residents in multiple ways, from easing the transition into public school for families, providing advanced education opportunities focused on the complex needs of active duty military members, to providing a familiar and comfortable environment for military retirees.

JBLM, in turn, provides direct employment for 52,000 active duty and civilian South Sound citizens, as well as demand for local services through its tens of thousands of active-duty personnel. The total economic impact in the South Sound region due to the presence of Joint Base Lewis-McChord in Pierce County is estimated to be upwards of $9.2 billion. (The Economic Impact of the JBLM workforce and operations on the South Sound Region, June 2018, Center for Business Data Analytics, University of Washington – Tacoma.)
Lakewood has long had restrictions on land uses within JBLM’s Clear Zone and Accident Potential Zones I and II in order to decrease the risk of injury to people and property and to maintain compatible activity in the City with JBLM’s operations. We wholeheartedly support Tacoma’s action to adopt the same approach.

Thank you for your consideration of these comments.

Sincerely,

John Caulfield, City Manager

cc:
Anna Petersen, Vice-Chair
Andrew Strobel, District 1
Dorian Waller, District 2
Brett Santhuff, District 3
David Horne, District 5
Jeff McInnis, Development Community
Carolyn Edmonds, Public Transportation
Ryan Givens, Architecture, Historic Preservation and/or Urban Design
Larry Harala, Associate Planner
Cristina Briseño  
7227 S Lawrence St.  
Tacoma, WA 98409  
Cell: (425) 308 3853  

November 5, 2018  

To: City of Tacoma  
Planning Services  
747 Market St. Room345  
Tacoma, WA 98402  

To whom it may concern:  

On October 24th I learned about the proposal regarding JBLM’s APZII. I learned that my house is located in the zone that will not allow any type of development and expansion of existing homes.  

I am concerned regarding your decision due to the following aspects:  

Your decision will impact on the value of my land and house in comparison with the areas that are allowed developments.  

I am also concern that the home insurance might go up due to the fact that I am located inside the risk zone.  

In this case I would like to take into consideration the following proposals and provide compensation such as:  

Freeze my property taxes.  

When the time comes to sell the house, and I am planning to do this in four — five years’ time, if I do not obtain an equal price with that of similar houses from the areas that are not within the risk zone, I wish to be compensated with the amount that I am deprived of.  

I would like to have a clear disclosure and a detailed information concerning the limits you are imposing to the safety risk zone where my house is located.  

Another question I have is: Is there any limit on the number of family members for the future potential buyers?  

I am looking forward to hearing from you.  

Sincerely,  

Cristina Briseño
From: Jeff Nolta [mailto:jnolta@integrity.com]  
Sent: Sunday, November 4, 2018 10:00 PM  
To: Harala, Larry <LHarala@ci.tacoma.wa.us>  
Subject: JLUS-ACOD Input

Mr Harala,

We met at the information meeting at the STAR Center on Oct 24. I wanted to take this opportunity to reiterate the questions and comments I made that night.

The risk associated with the APZ was referenced several times during your presentation and cited as the reason that the proposed property use regulations were being instituted. While I understand that the Military has an interest in mitigating risk, that risk first needs to be understood before any change should be contemplated. Does the level of risk in the APZ necessitate making property use changes obviously necessary? Or, is the risk so low as to be nearly non-existent? If so, then changing property use regulations and infringing on personal property rights is not warranted. The Military makes the recommendation that growth be limited in the APZ's, but they have no inherent interest in individual property rights. However, the City does, and should balance the need to mitigate risk with the rights of the property owners.

Any contemplation of land use regulation in the APZ should have been implemented many years ago. At this point, the APZ II in Tacoma is almost completely built out. Of the just under 500 (484) single family dwelling properties I counted in the overlay area, only 12 were vacant lots, or approximately 2.5%. Making significant land use regulation changes that will affect property owners when 97.5% of the lots already contain a single family structure seems completely unnecessary and unproductive. Similarly with commercial properties, there is only one vacant commercial property in the APZ overlay area. The proposed restrictions to commercial properties would have an extreme financial impact to many business owners, while doing very little to mitigate risk as it relates to density. Very few of the commercial properties in this area are of a type that would attract any significant concentrations of people. The negative financial impact would be far greater than the minimal mitigation of risk it would accomplish.

As the proposed changes pertain to the prohibition of ADU’s on SF properties, this also seems to be an unnecessary restriction, given the low level of increased density balanced against the rights of property owners. If we assume a very liberal estimate of 5% of the single family residences adding an ADU, or 24 properties, and assume an additional density of 2 persons per ADU, the entire area sees an increase of only 48 individuals, dispersed throughout the entire APZ overlay area. That number seems insignificant enough to not justify restrictions that would deprive owners use of their property that others in the city enjoy. It was only three years ago in 2015 that re-zoning was done to encourage MORE ADU’s in Tacoma!

I would ask that you first obtain data that would inform what the level of risk is in the APZ overlay area, then determine if that risk level requires infringing on property rights of individuals and businesses by the rezoning that has been proposed. From what I have seen, this proposal would make little to no impact on density, while unnecessarily infringing on property rights.

Thank you for your consideration.

Jeff Nolta
Comment Card
Share your thoughts!

Name: Tami Welch Date: 10-24-18
E-mail: 7442 S. Warner

Proposed JBLM Airport Compatibility Overlay District

- What is the emergency response plan if a crash does occur?
- Property values will be lowered - how will home owners be compensated for our losses?
- Increase in homeowner insurance cost will occur.
- We would love to see power lines moved underground.
- Why so much focus on this issue now? There has only been 1 military plane crash since the Korea War - no injured civilians (only 1 person survived on flight crew).

LEARN MORE AND PROVIDE YOUR INPUT:
- Attend the Community Information Meeting on October 24th
- Visit www.cityoftacoma.org/JLUS for more information
- Contact us at (253) 591-5845 or lharala@cityoftacoma.org
- Provide oral testimony at the November 7th Public Hearing
- Provide written comments by November 9th (via email, fax (253) 591-5433, or mail to address below)

Larry Harala, Associate Planner - 747 Market Street, Room 345 - Tacoma, WA 98407
## Staff Response to public comments

<table>
<thead>
<tr>
<th>COMMENTS</th>
<th>STAFF RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>(See pages 3-8 for the comments)</td>
<td></td>
</tr>
<tr>
<td>Bill Adamson of the South Sound Military and Communities Partnership (SSMCP)</td>
<td>Staff noted.</td>
</tr>
<tr>
<td>Rie Suzuki</td>
<td>At this time there is no program, nor funding, in place that would allow property acquisition or the relocation of residents.</td>
</tr>
<tr>
<td>Courtney Brunell – Ms. Brunell is the planning manager for the City of Lakewood.</td>
<td>The city of Lakewood has an Air Corridor designation in their comprehensive plan and reflected on its future land use map. The corridors are also called out in Title 18 of the Lakewood municipal code.</td>
</tr>
<tr>
<td>Barbara Hopkins</td>
<td>Staff has confirmed that HUD loans do include a verification on whether or not a property is within the Clear Zone, APZ I or APZ II. If the property is within one of these areas the property would not be eligible for a HUD loan. Staff will note that there are many variant HUD loan programs, so it is possible that the citizen was a participant in some other program.</td>
</tr>
<tr>
<td>Betsy Elgar</td>
<td>Staff noted.</td>
</tr>
<tr>
<td>Bill Dixon</td>
<td>Staff has conferred with two separate experts on home-owner’s/property insurance and both sources indicated that in a case like this it would be very unlikely that insurance rates would be impacted. <strong>Sources:</strong> Northwest Insurance Council (Kenton Brine, Director); Kim Wilson (Brown &amp; Brown, of WA. Broker for the city of Tacoma).</td>
</tr>
<tr>
<td>Scott Grover</td>
<td>HUD funds would not be available at present, a local level overlay district does not appear to have any impact on HUD financing. There appears to be no impact of local/municipal level action.</td>
</tr>
<tr>
<td>Jeff Hannem</td>
<td>Staff has attempted to address concerns about restrictions on residential properties in the revised recommendation.</td>
</tr>
<tr>
<td>Jeff Nolta</td>
<td>The Air Force has determined that there is an increased danger in this area, if a crash were to occur it would be catastrophic and likely to result in extreme loss of life and property. That is the main message the Air Force is conveying with the APZ II designation.</td>
</tr>
<tr>
<td>Venus Dergan</td>
<td>A disclosure would not be required for existing single family homes. However in the case of new development</td>
</tr>
<tr>
<td>Carolyn Hannemon</td>
<td>Information regarding the Arlington Elementary School Conditional Use Permit.</td>
</tr>
<tr>
<td>Pamela Nugent</td>
<td>Staff noted. Also under zoning in the area there are further requirements in TMC 13 that would need to be met and it is possible this would be something that would not be possible at present.</td>
</tr>
</tbody>
</table>

**Written COMMENTS** *(See pages 3-8 for the comments)*

**STAFF RESPONSES**

| Joint Base Lewis-McChord (Received) | Staff noted. |
| South Sound Military and Communities Partnership | Staff noted. |
| City of Lakewood | Staff noted. |
| Christian Briseño | Concerns about undue impact to existing single family residential properties has been frequently expressed by area residents. Staff is recommending some possible alternatives to the proposal that could potentially alleviate many or all of these concerns. |
| Jeff Nolta | Very good points about how built out the area is and how these measures would achieve a small amount of reduced density. Staff is recommending some possible alternatives to the proposal that could potentially alleviate many or all of these concerns. |
| Tami Welch | Staff is recommending some possible alternatives to the proposal that the proposal that will could potentially alleviate many or all of these concerns. |
Staff response to commission questions

- **Does the Military OR the City designate the APZ I and APZ II zones?**

  The military designates the APZ (APZ I-II, and the clear zone), Department of Defense through the Air Installation Compatible Use Zone Study (AICUZ) and the Joint Land Use Study (JLUS).

- **Are the APZ I and APZ II zones presently adopted/designated in a formal document? (in other words, are these existing or proposed designations in the south Tacoma neighborhood).**

  The City of Tacoma recognizes the Joint Land Use Study in the Public Facility element of our comprehensive plan. The City of Tacoma was also a formal participant in the JLUS and the APZ is a prominent part of the JLUS. The earliest JLUS document staff found was the 1992 JLUS (see the attached excerpt of the 1992 JLUS).

  The Air Force and Army, together with local planning authorities, issued the Joint Land Use Study (JLUS) to address land use issues of mutual concern. In the study, the Air Force designated Accident Potential Zones (APZ) for the McChord Air Force Base which are areas where an aircraft mishap is most likely to occur if one were to occur.

  The 1992 JLUS directly called for greater compliance with the AICUZ specifically:

  - Prohibit any new use which results in a concentration of people, more than an average of twenty-five (25) people per hour/per acre in a 24-hour period.
  - Prohibit any new development or redevelopment which results in an increase in density or intensity of current development.
  - New churches, schools, libraries and similar buildings that concentrate people should not be located in Accident Potential Zones I or II.
In 2004 the city of Tacoma’s neighborhood element of our comprehensive plan had a policy intent specifically aimed at “lowering residential densities and identifying flight hazards in the APZ II zone to limit injury and property damage in the event of an Air Force accident.” (See attached excerpt of the 2004-2008 South Tacoma Neighborhood Element).

- **If so, when were the APZ I and APZ II designations official assigned/adopted?**

  The APZ has been called out in the McChord Joint Land Use Study since 1992, it has been recognized in Pierce County Code since at least the late 1990s (though that doesn’t really matter here that is more pertinent to the southern JBLM APZ area). The 1992 Joint Land Use study prominently calls out the clear zone, APZ I and APZ II area and lays out what the compatible uses are. The City of Tacoma was a participant in that effort and in agreement with it, though a corresponding overlay district was not created at that time.

  There appears to have been an APZ designation around JBLM since at least the early 1980s based on anecdotal evidence, if not earlier, however staff could not find a specific document that confirmed that.

  The AICUZ program was established by the Department of Defense in 1973 to protect the mission of the air installations and the well-being of the surrounding communities. The intent of the program is to bring the Air Force and the community together to plan effectively for land use compatibility of remaining undeveloped areas surrounding air installations.

- **Are the alleged HUD and financial lending restrictions based on the APZ I/II designations?**

  According to the HUD lending checklist checking for the APZ is a standard question for all HUD loans and if the property is within an APZ/Clear Zone and not in a situation where the property is less than 2 DU per acre, then the property would be ineligible for a HUD loan. Where it gets very complicated though are in the plethora of HUD programs, like Section 8 housing, etc. there may well be many HUD programs that do not effectively check on APZ status. Staff was unable to exhaustively examine all HUD programs, but generally it appears to be a standard potentially disqualifying question for HUD loans.

- **Are the alleged HUD and financial lending restrictions based on the zoning overlay restrictions?**

  No. HUD does not appear to consider local overlay districts. In this case the APZ which is already in place would be the consideration.
• Are Fannie Mae/Freddie Mac Loans subject to any conditions regarding APZ (or local overlay districts) –

Staff found nothing relating to loan eligibility requirements for these programs in respect to APZ or a local airport overlay district.

• Are the crash/accidents statistics for APZ II in Tacoma similar to the same designation in other urban metro areas? (e.g. Tacoma’s APZ II accounts for 5% of all accidents which appears to be lowest of all zones, whereas, is this the same in San Diego, San Antonio, Orlando, etc.)

The provided data set at the public hearing was for all Air Force facilities, combined, for the years from 1965 to 1995.

Over the past few months’ staff has made a request on more than one occasion to several individuals involved with JBLM’s planning efforts, as well as persons in the military command (including Garrison Commander Tom Knight) and they have all not been able to provide any sort of specific data for JBLM beyond this data set. Staff is attaching reference material that gives more general information on aircraft safety.

**Boeing Aircraft Accident Data** -

![Fatalities by Phase of Flight Diagram](source)

*Sources: Statistical Summary of Commercial Jet Airplane Accidents, 1959 - 2008, Boeing*

**Military Times Crash Database** – This data includes all accidents and mishaps, which includes non-fatal events and events on the runway during takeoffs and landings. The trend is going up, and according to several sources that is being attributed to many aging aircraft and less maintenance funding.
Virginia Beach, Virginia – Oceana BRAC Process –

In 2005 The Virginia Beach Oceana Naval Air Base was identified under the Base Realignment and Closure Commission’s list of recommended base closures. A primary reason for this was relating to encroachment of incompatible development (according to the AICUZ) to the APZ I. In order to overcome the recommendation, the city of Virginia Beach, and the State of Virginia had to engage in major funding for aggressive property acquisition. In 2005 it was estimated that there were upwards of 1,300 incompatible uses in the Clear Zone and APZ I. The city underwent major code changes to prevent future incompatibilities and encourage compliance with the AICUZ. The city and state have spent in excess of $130 million dollars to purchase upwards of 2,400 acres of property, approximately $11 million dollars (as of 2015) had been recouped by selling air easement rights to the Navy.

Arlington Elementary CUP and SEPA processes –

In 2015 Arlington Elementary School applied for a Conditional Use Permit to update and expand the campus. During the CUP process JBLM issued letters in opposition to the expansion of Arlington Elementary School. The School districts response stated that unfortunately there was not an identified alternative location.

- The school predated the military presence in the area by six years
• The school district asserted that there is an existing school and this was not a proposal for a new school.
• A voter approved levy had funds earmarked for the project, and changing it would be tantamount to denying that.
• The school district took issue with aspects of the JLUS/AICUZ and felt there was sufficient room for interpretation.

The request was approved administratively by Planning and Development Services on January 26th, 2016. Staff can provide the letters and the decision for the commission if that is desired.

**Potential increase in property insurance cost** –

City staff checked with two different sources in the insurance industry Kenton Brine, President of the Northwest Insurance Council and Kim Wilson with Brown & Brown, an underwriter who handles insurance for the City of Tacoma and both indicated that a local overlay would not be something that insurance companies would use to set insurance rates. Typically, insurance companies look at risk and the risk is already there and the overlay does not change the risk. Kim Wilson explained that in general even where properties are directly adjacent to airports insurance rates are typically not higher. Mr. Wilson stated that in cases where a property is physically attached (a home with a private hangar that opens onto an airport) then that would be a case where rates are going to be impacted.
D. Appendices – Supporting information and articles
HUD Loan Guidelines – APZ

HUD Airport Hazards
(https://www.hudexchange.info/environmental-review/airport-hazards/)

Introduction
Some types of development are incompatible for locations in the immediate vicinity of airports and airfields. Potential aircraft accident problems pose a hazard to end users of these development projects. If the proposed project is located near an airport or in the immediate area of the landing and approach zones, additional information is necessary to determine whether this issue is a concern and if so, how to mitigate it.

It is HUD’s policy to apply standards to prevent incompatible development around civil airports and military airfields. See 24 CFR 51, Subpart D. The policies do not apply to research or demonstration projects which do not result in new construction or reconstruction, to interstate land sales registration, or to any action or emergency assistance which is provided to save lives, protect property, protect public health and safety, or remove debris and wreckage.

HUD Guidance
1. To ensure compatible land use development, you must determine your site’s proximity to civil and military airports. Is your project within 15,000 feet of a military airport or 2,500 feet of a civilian airport?

2. If so, is your project located within an Accident Potential Zone (APZ) or Runway Protection Zone/Clear Zone (RPZ/CZ)?

Accident Potential Zone (APZ)
Does your project involve any of the following: new construction; substantial rehabilitation; acquisition of undeveloped land; activities that would significantly prolong the physical or economic life of existing facilities or change the use of the facility to a use that is not consistent with the recommendations of the Department of Defense (DOD)’s Land Use Compatibility Guidelines; activities that would significantly increase the density or number of people at the site; or activities that would introduce explosive, flammable, or toxic materials to the area?

If so, is the project in conformance with DOD guidelines?

Runway Protection Zone/Clear Zone (RPZ/CZ)
Will this project involve any facilities that will be frequently used or occupied by people?

If so, were written assurances from the airport operator obtained?

If this project involves the acquisition or sale of an existing property that will be frequently used or occupied by people, you must provide written notice to the prospective buyer to inform them of the potential hazards from airplane accidents as well as the potential for the property to be purchased as part of an airport expansion project in accordance with 24 CFR 51.303(a)(3). (See Sample Notice to Prospective Buyers.) The written notice should inform the prospective
property buyer of: (i) the potential hazards from airplane accidents, which are more likely to occur within clear zones than in other areas around the airport/airfield; and (ii) the potential acquisition by airport or airfield operators, who may wish to purchase the property at some point in the future as part of a clear zone acquisition program.

HUD assistance may not be used at this location if project involves new construction, substantial rehabilitation, acquisition of undeveloped land, or activities that would significantly prolong the physical or economic life of existing facilities that will be frequently used or occupied by people.

Compliance and Documentation

The environmental review record should contain one of the following:

- Documentation that the rule is not applicable to the proposed project (i.e., acquisition of an existing building, "minor" rehabilitation, or emergency action)
- A map showing the site is not within 15,000 feet of a military airport or within 2,500 feet of a civilian airport
- If within 15,000 feet of a military airport, a map showing the site is not within a designated APZ or a letter from the airport operator stating so
- If within 2,500 feet of a civilian airport, a map showing the site is not within a designated RPZ/CZ or a letter from the airport operator stating so
- If the site is in a designated APZ, documentation of consistency with DOD Land Use Compatibility Guidelines
- If the site is in a designated RPZ/CZ and the project does not involve any facilities that will be frequently used or occupied by people, and a determination of such and a written assurance from the airport operator that there are no plans to purchase the land as part of a RPZ/CZ program
- If the site is in a designated RPZ/CZ and the project involves the acquisition or sale of an existing property that will be frequently used or occupied by people, a copy of the notice to prospective buyers signed by the prospective buyer
## Clear Zones (CZ) and Accident Potential Zones (APZ)

**Checklist for HUD or Responsible Entity**

<table>
<thead>
<tr>
<th>General requirements</th>
<th>Legislation</th>
<th>Regulation</th>
</tr>
</thead>
</table>

1. **Does the project include new construction, major rehabilitation, or any other activity which significantly prolongs the physical or economic life of existing facilities?**
   - **No:** STOP here. The project is not subject to the regulations. Record a description of your project and your determination.
   - **Yes:** PROCEED to #2

2. **Is the Project located within 3000 feet of a civil airport or within 15,000 feet of a military airfield?**
   - **No:** STOP here. The regulations only apply to military and civil primary and commercial service airports. The Federal Aviation Administration updates the list of applicable airports annually:
   - **Yes:** PROCEED to #3

3. **Is the Project in the Clear Zone or Accident Potential Zone?**
   - **No:** STOP here. Maintain the written documentation from the airport operator. Identify the location of your project in relation to the clear zone. Record your determination that the project is not in a CZ or APZ.
   - **Yes:** Project is in an Accident Potential Zone: PROCEED TO #4

4. **For Accident Potential Zones at Military Airfields, does the project change the use of a facility so that it becomes one which is no longer acceptable in accordance with Department of Defense standards (Please see 32 CFR Part 256 for Land Use Compatibility Guidelines for Accident Potential Zones), significantly increase the**
The death toll for rising aviation accidents: 133 troops killed in five years


By: Tara Copp, Military Times

In the last three weeks, six military aviation crashes have killed 16 pilots or crew — a tragic development that has cast a spotlight on a growing crisis: Accident rates have soared over the last five years for most of the military’s manned warplanes. Through a six-month investigation, the Military Times found that accidents involving all of the military’s manned fighter, bomber, helicopter and cargo warplanes rose nearly 40 percent from fiscal years 2013 to 2017. It’s doubled for some aircraft, like the Navy and Marine Corps’ F/A-18 Hornets and Super Hornets. At least 133 service members were killed in those fiscal year 2013-2017 mishaps, according to data obtained by Military Times.

The rise is tied, in part, to the massive congressional budget cuts of 2013. Since then, it’s been intensified by non-stop deployments of warplanes and their crews, an exodus of maintenance personnel and deep cuts to pilots’ flight-training hours. “We are reaping the benefits — or the tragedies — that we got into back in sequestration,” said retired Air Force Gen. Herbert “Hawk” Carlisle, referring to the 2013 cuts. The sharp increase in mishap rates is “actually a lagging indicator. By the time you’re having accidents, and the accident rates are increasing, then you’ve already gone down a path,” said Carlisle, who led Air Combat Command until 2017.

“If we stay on the current track ... there is the potential to lose lives.”

The rise in aviation mishaps has not surprised former Defense Secretary Chuck Hagel, who led the Pentagon in 2013 when the cuts were enforced. “We stopped training, for months,” Hagel said. “Of course, all of that affected readiness. It’s had an impact on every part of our defense enterprise,” he said. "And that means, surely, accidents." Military Times has compiled and published online a database of individual reports of all Class A through Class C mishaps that have occurred since fiscal year 2011, then focused on the 5,500 aviation accidents that occurred between fiscal years 2013 and 2017.

Of those 5,500 accidents, almost 4,000 were generated by the military’s fleet of manned warplanes — all of its bombers, fighter aircraft, cargo aircraft, refuelers, helicopters and tiltrotors. In 2013, those aircraft reported 656 accidents per year. By 2017, the rate had skyrocketed to 909 per year, an increase of 39 percent.
The accident data was obtained through multiple Freedom of Information requests to the Naval Safety Center, the Air Force Safety Center and the Army Combat Readiness Center. Collectively, the records offer unprecedented insight into the rise of aviation mishaps during the past five years. It shows that the problems in the Navy and Marine Corps appear far more severe than those in the Air Force. And the accident rates for individual aircraft platforms vary significantly.

While hundreds of mishap reports involve life-threatening and fatal accidents, the database also reveals a steady rise in relatively minor incidents, such as a maintainer injured by falling airframe components, collisions on flight decks during taxi maneuvers or minor birdstrikes. Across the board, much of the increase was due to a spike in those less serious mishaps, known as Class Cs, which include any incident that costs at least $50,000 and potentially up to $500,000 to fix, or leads to injuries serious enough to cause lost work days.

<table>
<thead>
<tr>
<th>Class</th>
<th>Cost</th>
<th>Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$2 million or more or aircraft destroyed</td>
<td>Fatality or permanent disability</td>
</tr>
<tr>
<td>B</td>
<td>$500,000 or more but less than $2 million</td>
<td>Permanent partial disability or three or more people hospitalized</td>
</tr>
<tr>
<td>C</td>
<td>$50,000 or more but less than $500,000</td>
<td>Nonfatal injury resulting in lost work days</td>
</tr>
</tbody>
</table>

Source: Defense Department

However, the rapid rise of minor incidents should not be dismissed, defense analysts said. That spike “is your early warning,” said Todd Harrison, the director of the Aerospace Security Project at the Center for Strategic and International Studies. “That’s your warning that there’s a problem and you need to do something before something bad happens. It’s like a canary in a coal mine.”

Recent events have drawn new public attention to the issue. In the past three weeks, six more military aviation accidents have killed 16 pilots or crew, and destroyed six aircraft. Two Navy aviators were killed March 14 when their F/A-18F Super Hornet crashed during a training flight in Florida. A day later, seven airmen were killed when their HH-60 Pave Hawk crashed in western Iraq during a routine transit flight. On April 3, two more crashes occurred. A Marine Corps AV-8B Harrier crashed during takeoff in Djibouti; the pilot ejected and survived. Later that day however, a Marine Corps CH-53E Super Stallion helicopter crashed during a training flight in California, killing the four crew members on board. The next day, April 4, there was another loss. An F-16 from the Air Force’s Thunderbirds crashed near Nellis Air Force Base, Nevada, killing the pilot. On April 6, two soldiers were killed when their AH-64 Apache attack helicopter crashed during a training flight at Fort Campbell, Kentucky.
While the causes of each crash won’t be known until command investigations are completed, Congress will get a chance to ask about the crashes next week in hearings on Capitol Hill. On Thursday, Defense Secretary Jim Mattis and Chairman of the Joint Chiefs Gen. Joseph Dunford will testify before the House Armed Services Committee on the military’s needs going into the 2019 fiscal year. Several hours later, top aviation officers from all four branches will also testify before the tactical air and land subcommittee on their 2019 combat aviation request.


It’s not clear how blunt each service will be, as Mattis has previously warned them not to talk publicly about things like aviation readiness concerns. “While it can be tempting during budget season to publicly highlight readiness problems, we have to remember that our adversaries watch the news, too,” Mattis directed through a memo obtained by Military Times that was sent to the service chiefs last year. “Communicating that we are broken, or not ready to fight, invites miscalculation.”
Last week, Joint Staff director Lt. Gen. Kenneth McKenzie, in a weekly press briefing at the Pentagon, rejected the idea that the recent accidents were an indicator of a larger problem. "I would reject 'wave' and 'crisis,'" McKenzie said. "Those are mishaps that occurred. We're going to look at each one in turn. Each one is tragic. We regret each one. We'll look at them carefully. I'm certainly not prepared to say that it's a wave of mishaps or some form of crisis." Many service members, however, hope Congress won't buy that. "Hopefully someone in Congress will wake up and realize things are bad and getting worse," said one active duty Air Force maintainer, who has worked on A-10s, F-16s and F-15s. "The war machine is like any other machine, and cannot run forever. After 17 years of running this machine at near capacity, the tank is approaching empty."

The 2013 climb

That the spike began in 2013 is significant. That was the year sequestration, the automatic budget cuts agreed to by Congress and former President Barack Obama, took effect. "We had to cut $50 billion over 10 months that had not been planned for or budgeted for," Hagel said. At the time, the military's aviation mishap rates were improving, after getting some relief due to the 2011 drawdown of forces in Iraq. Then sequestration hit. Instead of a well-funded reset, each service was mandated to execute steep budget cuts.

To absorb the cuts, each service had to make hard choices. Personnel were much easier to cut than weapons programs; which often have three- or five-year spending obligations, with expensive fines for canceling. The services' decision at the time to cut experienced maintainers continues to impact aviation readiness today. Critics say the services decided to cut people in order to protect aircraft platforms — like the F-35 joint strike fighter — dealing a self-inflicted wound that made things worse. "Look at the federal budget and tell me that the money isn't there," the Air Force maintainer said. "There is plenty of money there. Plenty," the maintainer said. "It's how they choose to spend it that needs to be analyzed and micromanaged because military leaders have failed us, in more ways than one."

ISIS

A year after the sequester cuts, the global security landscape changed dramatically. In summer 2014, Islamic State militants conquered a wide swath of Iraq and Syria. China built militarized man-made islands in the South China Sea, and Russian forces invaded the Ukrainian territory of Crimea. U.S. air power responded in each case. "There was a lot going on at the time," recalled Col. Anthony Bianca, head of Marine Corps aviation plans and programs. "And then sequestration hits. Morale was low between 2013 and 2015." Mishaps rose 13 percent from 2013 to 2014, and kept climbing through 2017.
Notably, the number of mishaps climbed despite the fact that overall, the military flew those manned warplanes 170,000 fewer hours in 2017 than it did in 2013.

In interviews, military officials acknowledged readiness was hurt by the sequester cuts, but they cautioned against tying the rise in mishaps directly to the cuts in funding. Still, they did not have an answer for what caused the spike.

“I don’t want to speak to any correlation or causality of an increase in mishaps,” said Capt. David Koss, the Navy’s top aviation readiness officer. “But from a readiness perspective, I can say that [budget pressure] has made it much more challenging to get readiness, which does increase undue risk.”

Across all platforms, manned and unmanned, Class C mishaps rose from 808 in fiscal year 2013 to 1,055 in fiscal year 2017. That’s worrisome, defense analysts said. A Class C has the possibility of quickly becoming a Class A — the worst type of mishap — if a pilot has not had enough flying time to have it ingrained how to react. A Class A mishap means death of the pilot or crew, damage of $2 million or more, or loss of the aircraft.

Class A mishaps, across all platforms, climbed 17 percent in the same time frame, from 71 accidents per year in 2013 to 83 accidents per year in 2017. Based on a review of accident reports and open records, at least 133 service members deaths were attributed to those Class A accidents.

**Stats since 2013**

All four military services have reported a rise in mishaps over the past five years.

♦ Marine Corps mishaps jumped 80 percent, driven by Class C ground maintenance problems, such as towing incidents or tools damaging aircraft engines or canopies.

♦ Navy mishaps jumped 82 percent, driven by a 108 percent increase in incidents — mostly Class Cs — involving the F/A-18 E/F Super Hornets.

♦ Air Force mishaps rose 16 percent, driven by a rise in Class C incidents such as physical injuries in C-130H and C-17A cargo aircraft, gun-related mishaps in A-10 Warthogs, and other assorted mishaps in the F-16.

♦ Army mishaps overall rose 6 percent but declined for its most-used manned rotary aircraft.
By percentage, the mishaps hit the Navy and Marine Corps the hardest because their air fleets are about half the size of the Air Force and Army’s, so each individual incident made a bigger statistical impact. However, the spikes in Class Cs have all of the services’ attention. “They’ll tell you it’s a pyramid,” Bianca said. “If you are having more Class Cs, then your chances of having more Class Bs or Class As go up ... I’m not sure I agree with that math, but if it’s preventable, then we need to prevent it.”

Certain airframes were hit harder than others. For all variants of the H-60 — the Army’s Black Hawk, the Air Force’s Pave Hawk and the Navy’s Seahawk — the services flew 39,400 fewer hours in 2017 than they had in 2013. Mishaps rose from 80 to 90 in that same time frame. The Air Force’s F-16s flew 190,000 hours in fiscal 2013, reporting 54 mishaps. The hours held steady — F-16s recorded 189,000 flight hours in 2017 — but mishaps hit a seven-year high in 2017, with 78 reported.

All variants of the C-130 flew 20,000 fewer hours in 2017 than they did in 2013. Mishaps rose from 80 to 99 in that same time frame. Navy and Marine Corps F/A-18 Hornets flew 39,000 hours less in 2017 than they did in 2013. Hornet mishaps rose from 19 to 31 per year in that same time frame. That mishaps spiked as flight hours fell isn’t surprising, analysts said. The less frequently a pilot flies or a maintainer works on an aircraft, the less current their skills are. That adds risk, said Dan Grazier, a former Marine Corps captain who is now a military fellow with the Project on Government Oversight in Washington. “The lack of flight hours — that is the big thing I am hearing from my friends still in the service,” Grazier said. “What if they run into one of those situations where there is a minor issue with the aircraft, or where they run into an emergency situation. That is where experience comes into play.”
The sequester impact

In the months before sequestration took effect, military leadership gave lawmakers plenty of warning on the fallout. “There’s not going to be any operations and training money left for the [non-deployed] force,” warned Gen. Martin Dempsey, the former chairman of the Joint Chiefs of Staff, in January 2013. That March, DoD lost about $37 billion from its base budget and received about $30 billion less in overseas contingency funding.

The services responded by reducing training and exercises, then cutting the number of experienced maintainers and pilots. However, military officials made those personnel cuts without tracking what qualifications and skill sets were walking out the door. Anyone with 15 years in service was eligible to retire with benefits, which meant the military lost upper mid-grade, highly trained personnel. The services cut more junior service members, too. “We were cutting people. We were cutting billets and those positions that are very important as you build into the future,” Hagel said. “The consistency of that quality of people, the consistency of the training and preparation, it matters, and it will show up later.”

In the Air Force, which shed almost 1,400 maintainers to address budget shortfalls, the increased workload generated by older, more maintenance-heavy warplanes was carried out by a smaller and less experienced workforce. “In my career field, experienced maintainers are a thing of the past,” the Air Force maintainer said. “Hardly anyone stays longer than they have to stay. Continuous training is non-existent for most maintainers.”

The Navy is now studying what impact maintainer cuts had on the fleet. It has found that mid-grade enlisted maintainers now have an average 1.5 years less experience than their predecessors. It also found “a continued degrade in the number of supervisors, meaning chief petty officers, senior chief petty officers, as the years have gone by,” said Navy Capt. John Fischer, who heads naval aviation safety for Commander Naval Air Forces. “We compared that to the VFA [strike fighter] community’s mishaps over the same time period, and we were able to directly correlate ... an increase in mishap rates as the level of years of service in supervisors went down. Not causal, but definitely a correlation,” Fischer said. The strongest correlation was found between lack of experience and the Class C mishaps, Fischer said.
Maintainer tracking

When the Marine Corps executed its cuts in 2013, Bianca said, leadership just looked at the occupational specialty codes to maintain “this many corporals, sergeants, staff sergeants and gunnys, and tried to balance the manpower pyramid, which by law we are required to do.” The Corps didn’t take into account whether that maintainer had obtained more senior qualifications, such as a collateral duty inspector, someone with the skills and experience to examine others’ work and ensure safety standards.

“Now we record that,” Bianca said, adding that a qualification like that can qualify a Marine for incentives. “We lost a lot of that middle management, that salty, very experienced sergeant who can shoot the bull with you and knows exactly what is supposed to be happening, what you are supposed to be doing, and maintains the discipline. The NCO that keeps things going the right way,” Bianca said.

The maintainer cuts are noticeable on the flight line, Air Force Chief of Staff Gen. Dave Goldfein told reporters last fall. “When I started flying airplanes as a young F-16 pilot, I would meet my crew chief and a dedicated and a secondary crew chief at the plane,” he said. “We’d … walk around the airplane. I’d taxi out. I’d meet a crew that was in the runway, and they’d pull the pins and arm the weapons and give me a last-chance check. I’d take off.” At his destination, a new crew would be waiting to perform a post-flight inspection and any needed maintenance, Goldfein said. Today, what often happens is “you taxi slow because the same single crew chief that you met has to get in the van and drive to the end of the runway to pull the pins and arm the weapons.” “Then you sit on the runway before you take off and you wait, because that crew chief has to go jump on a C-17 with his tools to fly ahead to meet you at the other end.”

Rise in risk

By 2017, the U.S. had expanded its air campaign in Afghanistan, conducted tens of thousands of airstrikes in Iraq and Syria, increased strikes against the Islamic State and other terror groups in Africa, increased its patrols and air power in response to North Korean missile tests and Chinese militarization, and beefed up security theater packages in Europe in support of Operation Atlantic Resolve.
To meet the increased demand — with less money and fewer people — the services pushed readiness to the front lines. Pilots and maintainers stateside flew less, maintained less and lost proficiency. For lack of spare parts, maintenance backlogs and other issues, more and more warplanes couldn’t fly. Fewer personnel also meant others deployed more, adding pressure on military families. For all of these reasons, many service members opted to leave the service. “What happens then if the units aren’t adequately resourced? They’re flying less, right? Because they don’t have all the money and parts they need to keep the airplanes flying, and therefore, obviously, they’re maintaining less,” said Koss. “So if they’re flying less and they’re maintaining less, it puts more pressure on readiness.”

**Class A losses**

When a Class A mishap occurs, it is almost invariably the result of a chain of events, culminating with the pilot’s reaction to that chain. It’s part of the reason why the services are paying close attention to the Class C mishaps from a maintainer standpoint. In January 2015, a fatal UH-1Y crash took the lives of Marine Corps pilot Maj. Elizabeth Kealey and co-pilot Capt. Adam Satterfield. Crash investigators found an improper installation of the filter, filter retaining ring and cover allowed oil to spill out during flight. The pilot’s incorrect assessment of the seriousness of the warning that oil pressure had dropped led to the fatal incident.

The filter was a known issue. Three waivers had been granted to allow the helicopter to keep flying until it could be addressed. But the filter’s retaining ring had been installed upside-down, which prevented a proper seal of the cover. “It is reasonable to surmise that if the aircraft waiver was never approved and the filter assembly had been previously replaced with the correct sealant, this mishap would have never occurred,” the investigating board found.

Neither pilot had flown 17.8 hours, the Marine Corps’ monthly goal, in the 30 days prior to the crash; Kealey had flown 11.2 hours; Satterfield, 10.7, but the report did not find that to be a contributing factor in the crash. “Aeronautical judgement does get better with increased flight time, but [Maj.] Kealey had a sufficient amount of experience to offset the small deficit in flight time over the past 30 days,” the investigation found. The investigation did recommend that the squadron take steps to ensure “the proper supervision of flightline maintainers.”

**Aircraft 205**

The April 21, 2017, crash of “Aircraft 205,” a Navy F/A-18E Super Hornet was another mishap that could have been kept to a Class C but ended with the destruction of the aircraft. On that day, VFA 137, a strike fighter squadron attached to the aircraft carrier Carl Vinson, had 10 jets launching for an exercise near the Philippines. But in final flight checks, one of the two-ships couldn’t depart — one aircraft was unflyable. The squadron provided a substitute F/A-18E, Aircraft 205. That aircraft had just come back online after a fuel cell replacement. However, the check flight to return to operations had revealed other issues.
The communications link that provided Aircraft 205 with situational awareness of other jets worked only on deck, not in the air. The tactical air navigation system that directed 205 to the ship only worked after the Super Hornet was already overhead. The dump switch, which allows a pilot to dump fuel in an emergency, “would not electronically stay in the ‘dump’ position,” according to the Navy’s official accident report. One of the pilots assigned to the two-ship that day was a Navy captain with more than 4,100 flight hours, 3,800 of those in the F/A-18. The other aircraft pilot was a Navy lieutenant with 320 hours in the jet. Because 205 passed the check flight, “all involved thought [the captain’s] experience was better suited for Aircraft 205,” since it was common for long-time down jets to have minor issues. The junior officer was assigned to fly the more reliable jet.

As VFA-137’s Super Hornets flew back to the Vinson after the exercise, multiple systems on 205 failed.

![Navy Aviation Mishaps](image)

The communications link failed, leaving the pilot with no situational awareness of other aircraft as the jets approached the Vinson to land. Then, indicator lights began to flash, signaling he was losing hydraulic fuel. He lost rudder control and had to idle the right engine. Troubleshooting with the Vinson’s tower ensued, but investigators found the tower representative in charge of bringing 205 in — another Navy lieutenant with 237 flying hours in the Super Hornet — “was not experienced enough to handle the emergency situation.”

Over the next 18 minutes, the pilot “became overwhelmed with flying the jet,” the investigation found. “Despite over 4,000 hours, he never had a situation where the jet was fighting him so much.” He ultimately ejected, surviving with injuries. Aircraft 205, worth $57 million, crashed into the Celebes Sea and was a total loss.
Light at the end of the tunnel?

On Feb. 9, Congress passed a two-year budget deal. It provides $700 billion to DoD for fiscal 2018 — now six months into the spending year — and $716 billion for fiscal 2019. President Trump signed the spending pact into law the same day. Service officials should take mishaps into consideration as they determine how to spend that money, said John Pendleton, director of readiness and force structure issues at the Government Accountability Office.

“Traditional readiness, at its core, is the sum of equipping, manning and training,” Pendleton said. “If you have an increase in mishaps, you likely have an issue in either training, equipping or manning, or possibly all three.” But officials also must determine whether the increase in mishaps is really tied to money at all, Harrison said. “What worries me is people think they just need to throw money at the problem,” he said. “What they first need to do is really research what are the factors that are affecting these mishap rates.

“It could very well be how the funding is being used, for example the type of training or maintenance to be accomplished with that funding,” Harrison said. “It could be issues with personnel, it could be issues with leadership. What this does tell you for sure is the readiness of the force to be able to operate safely is going down and this is not a good trend.”

Air Force Times senior writer Steve Losey contributed to this report.
1.6 - MILITARY INSTALLATIONS AND SUPPORT

Virginia Beach proudly hosts three military installations, including the U.S. Navy’s East Coast Master Jet Base. These include:

- Joint Expeditionary Base Little Creek-Ft. Story (U.S. Navy – U.S. Army)
- NAS Oceana and Dam Neck Annex (U.S. Navy)
- Camp Pendleton (VA National Guard)

This military presence dates back to the early 20th Century and has come to be a defining character of our city, influencing its growth, economy, and land use patterns through the years. The City supports a continued strong military presence, both now and in the years to come. Our commitment to ensure this includes:

- adopted land use plans as part of this Comprehensive Plan;
- Air Installations Compatible Use Zones (AICUZ) zoning regulations;
- a land acquisition program to reduce incompatible residential density and use encroachment and annual reporting;
- a business relocation incentive program; and,
- advocacy and advisory partnership committees.

We work closely with local and regional military leaders, the United States Congress, the Commonwealth of Virginia, and neighboring municipalities to reduce incompatible land use encroachment, and to prevent future incompatible land use, i.e., encroachment, from occurring adjacent to our military installations. We absolutely recognize the value and importance that the Department of Defense places on its unique training facilities in our city. We desire to work in continued partnership to play host to their mission and their families, who are such an integral part of our diverse community. We desire to be a home to military veterans exiting their distinguished service to our nation and to fully assimilate them into our community through workforce development training to transition and apply their special skills in the civilian sector and through veterans care programs.

Virginia Beach and the Hampton Roads region have long relied on the military industry as a major thrust of our local and regional economy. Our military presence has enabled us to remain relatively resilient in times of economic recessions. However, as discussed further in Chapter 2, Section 2.4 - Economic Vitality, the region understands fully that in addition to supporting the military presence and benefitting from it, it is imperative that we also have a diverse and sustainable regional and local economy. For example, the Navy Region Mid-Atlantic Hampton Roads Area FY 2013 Economic Impact Report indicated that the Navy’s direct economic impact on the Hampton Roads area was approximately $9.2 billion, a decrease of approximately $1.8 billion or 16.4% over FY 12’s total of $11 billion. Procurement expenditures decreased from approximately $2.8 billion in FY12 to about $1.3 billion. The Hampton Roads area had an overall decrease of about $1.5 billion in procurement expenditures. Active duty military pay decreased by $306 million; retired and survivors pay increased by $76 million; civilian pay decreased by $54 million; NAF increased by $0.5 million and...
contractor pay decreased by $55 million. This reduction in military spending as part of a defense budget reduction has affected Hampton Roads localities and many, if not all, localities in the nation with a military presence. In many cases, just as we are experiencing here locally, this trend is being supplanted by growth in other industries.

THE MILITARY PRESENCE TODAY

Joint Expeditionary Base Little Creek – Ft. Story (JEBLCFS) (U.S. Navy – U.S. Army)\(^1\)

JEBLCFS is the largest military employer in the city of Virginia Beach. It is the major East Coast base supporting overseas contingency operations (OCO), with 130 resident commands, including 3 flag officers. The installation consists of 3,947 acres of land and includes 61 piers and 7.6 miles of beachfront, and a total of 126 training sites. As of January 31, 2015, JEBLCFS homeports 24 Navy Auxiliary Ships, the USCGC Vigorous, and 126 small craft. The total base population is 19,179 (Little Creek Base: 16,658; Ft. Story Base: 2,821). Base population growth since September 11, 2001 has been just under 10,000 persons or almost 100%. To accommodate the growing presence, there are now 1,155 base housing units, with 337 units located inside the fence line. Estimated payroll is $1.3B, making a substantial impact on the City’s economy.

The character of the base has changed since September 11, 2001, becoming more expeditionary in nature. According to base planners, JEBLCFS is becoming the training site of choice for the joint
community due to characteristics that are unique to the East Coast. It is recognized as an irreplaceable “National Joint Training Asset,” offering joint logistics over the shore training and a nearly full mission profile for special operations training. Recent trends indicate that more units are conducting training locally, decreasing travel training dollars. Through strong community engagement with City of Virginia Beach leaders and city planners, encroachment is manageable with community support.

Transfers have occurred since the last Comprehensive Plan update in 2009. During 2013-2014, the following operations were relocated:

- Navy CYPERFOR and NETWAR Commands (relocated to Suffolk) – due to recurrent flooding associated with sea level rise impacts.
- PCRON/Coastal Patrol Craft (relocated 5th AOR/Mayport, FL)
- USS Fort McHenry (homeport shift to Mayport, FL)

Base mission growth in the future is anticipated to consist of an increase in Explosive Ordnance Disposal Group 2 Operations; expansion of the Naval Special Warfare and Support Activity footprint; gains in training vessels and equipment; and an increase in training operations/capacity.

JEBLCS is a committed steward of its cultural and natural resources, working closely with the City and non-profit organizations to inventory and protect these assets. Some of these include the Cape Henry lighthouses, the original base chapel, the First Landing site, and the various monuments documenting the strategic role that Cape Henry played during the American Revolution and the War of 1812.

JEBLCS has a robust community engagement program, ensuring that it works in partnership in a variety of needs identified as mutually important. These include:

- Quarterly meetings with City of Virginia Beach leadership
- Virginia Beach City Public Schools
- Virginia Beach Education Association
- Partners in Reducing Sexual Assault
- Federal Aviation Administration
- Hampton Roads Chamber of Commerce
- Virginia Beach Bayfront Advisory Commission
- Military Economic Development Advisory Committee
- Joint Military Services School Liaison Committee
- Military Child Education Coalition
- Hampton Roads Planning District Commission
- Virginia Military Advisory Commission
- Central Virginia Food Bank
- USO of Hampton Roads and Central Virginia
• Armed Services YMCA

Since 2009, City and base planners have developed an “Areas of Interest” map (see next page) and list of land uses of particular interest to the base. These tools assist both parties in determining which proposed uses may be in potential conflict or encroachment with base mission and operations. The Department of Planning & Community Development provides the base Community Planning Liaison Officer (CPLO) an opportunity to review and comment on development applications located in the Areas of Interest, prior to Planning Commission or City Council public hearing. The City’s Public Works and Public Utilities Departments are in routine communications with base planners to inform them about pending infrastructure construction projects (i.e., roadway repair, bridge maintenance, underground utilities work, etc.) in consideration of personnel mobility along the Shore Drive corridor between the two base areas at Little Creek and Fort Story.
Naval Air Station Oceana and Dam Neck Annex (U.S. Navy)\[ii\]

Naval Air Station (NAS) Oceana is the Navy's only Master Jet Base on the East Coast and supports the training and deployment of the Navy's Atlantic and Pacific Fleet FA-18 C/D Hornet and FA-18 E/F Super Hornet squadrons. Four carrier air wings (CVWs) are homebased at NAS Oceana and deploy with carrier strike groups embarking from Naval Station Norfolk (NS). Strike Fighter Wing Atlantic, which mans, trains, and equips 18 FA-18 Hornet and Super Hornet squadrons, is also located at NAS Oceana. Naval Auxiliary Landing Field (NALF) Fentress, located 7 miles southwest of NAS Ocean in Chesapeake, Virginia, is equipped to simulate aircraft carrier flight decks and supports training operations by strike fighter squadrons from NAS Oceana.

![Map of NAS Oceana, NALF Fentress, and Interfacility Traffic Area (ITA) Locator Map](image)

The Navy employs 17,000 personnel at NAS Oceana, NALF Fentress, and a third installation, NAS Oceana Dam Neck Annex, locally referred to as “Dam Neck.” NAS Oceana generates over $1 billion in payroll, and goods and services annually.

The FA-18 C/D Hornet and FA-18 E/F Super Hornet are the predominant aircraft stationed at NAS Oceana and account for the majority of aircraft operations at the airfield. Operations conducted as part of the typical training syllabus for flight crews include departures, arrivals, touch-and-gos, and practice radar approaches. NAS Oceana flight crews also conduct field carrier landing practice (FCLP) at NALF Fentress and training operations in offshore training areas.
Aircraft engine maintenance “run-ups” are primarily conducted in NAS Oceana’s acoustical aircraft facility, known as the “Hush House.” The Hush House enables maintenance personnel to test jet engines that are installed in aircraft in a fully-enclosed building. The noise absorbing materials of the building’s interior, combined with dense exterior walls, eliminate engine noise that would otherwise be heard by neighboring Virginia Beach residents.

NAS Oceana Dam Neck Annex
Dam Neck Annex is home to 20 operational, training and support commands. The installation includes 1,919 acres and includes 3.2 miles of coastline along the Atlantic Ocean. It serves as the Navy’s Training Center of Excellence, instructing over 20,000 students annually in over 210 courses of instruction.

Additional training and Navy Fleet support areas include:

- Synthetic warfare training to Carrier Strike Group and Amphibious Ready Group Staffs, Warfare Commanders and specified units/commands
- 24/7/365 Maritime Domain Awareness (MDA) support and vital maritime surveillance information to the Atlantic Fleet
- State-of-the-art intelligence training including real world applications

A Memorandum of Understanding has been established between the City of Virginia Beach and the U.S. Navy covering the use of the Dam Neck Annex South Gate for emergency response supporting Sandbridge residents and natural disaster evacuation routing.

Camp Pendleton/State Military Reservation

Camp Pendleton/State Military Reservation (SMR) is a Virginia Army National Guard facility located just south of the main resort area of Virginia Beach. The facility was originally laid out on approximately 400 acres in 1911 with construction beginning in 1912. Today, SMR occupies approximately 300 acres with an additional 27 acres leased from the federal government.

SMR is defined by the intact landscape created by the dominant building type, World War II-era temporary buildings, and the examples of earlier 20th century military and residential building types. The post is buffered from the public streets by extensive trees and landscaping, in addition to the required security fencing along the perimeter. The Guard currently leases a number of the buildings, particularly the WWII barracks, to various military and civilian agencies.

The first major building campaign after WWI was the construction of the REDHORSE facilities (1990s) at the north end of Regimental Camp #1 and south of Warehouse Road. The 203rd
REDHORSE Flight units is a construction and repair unit for the Virginia Air National Guard and their headquarters is located at SMR. A memorial is located in this area to honor the airmen from REDHORSE who were killed in an airplane accident returning from training in March 2001. Additional construction projects executed during the late 1990s include an armory at the corner of General Booth Boulevard and Birdneck Road.

Development pressure from the City led to the transfer of some SMR parcels of land from the Guard to the City during the 1990s. These parcels included acreage beyond the original cantonment area of SMR. As a result, the boundaries of SMR incorporate all the land (with the exception of a small tract south of Lake Christine leaded from the federal government) between General Booth Boulevard, Birdneck Road, Rifle Range Road, the Atlantic Ocean, and the Croatian neighborhood. A 14.94-acre parcel of land just west of Headquarters Loop along the property boundary at General Booth Boulevard has been leased to the City for use as a parking lot by the Virginia Aquarium.

Despite the few intrusions to the original plan and subsequent configuration of Camp Pendleton/State Military Reservation, the integrity of both the architectural resources and cantonment features dating from 1912-1945 have remained intact and well preserved. As a result, the Camp Pendleton/State Military Reservation Historic District was listed on the Virginia Landmarks Register in June 2004 and on the National Register of Historic Places in September 2005 as the City’s first and only, to date, state and national register historic districts.

AIR INSTALLATIONS COMPATIBILITY USE ZONES (AICUZ) AND LOCAL LAND USE PLANNING

The chief sources of noise at an airfield are maintenance run-ups and flight operations. Data on both sources of noise is incorporated into NOISEMAP, the DOD-approved computer model that projects noise impacts around military airfields, to develop a graphic depiction of noise exposure. Noise exposure is assessed for AICUZ purposes using the day-night average sound level (DNL) noise metric. The DNL is depicted graphically as a noise contour that connects points of equal noise value.

The AICUZ Program divides noise exposure into three categories, known as noise zones. Noise zones 1 through 3 are developed based on the DNL, and each noise zone has associated land use control recommendations. The noise zones provide the community and planning organizations with a necessary tool to plan compatible development near airfields. The noise zones for NAS Oceana and NALF Fentress are the noise zones presented in the 2005 Joint Land Use Study (JLUS) [link](http://www.hrpdcva.gov/uploads/docs/1JLUSEXecSumm--Final.pdf)

While the likelihood of an aircraft mishap occurring is remote, the Navy identifies areas of accident potential based on historical data from aircraft mishaps, known as Accident Potential Zones (APZs), to assist in land use planning. The Navy recommends that certain land uses that concentrate large numbers of people—apartments, churches, and schools—be constructed outside APZs. Historical data show that most aircraft mishaps occur on or near the runway, diminishing in likelihood with
distance from the runway. APZs follow departure, arrival, and pattern flight tracks and are based, in part, on the number of operations conducted for specific flight tracks. The three standard APZs, in order of accident potential are the clear zone, APZ 1 and APZ 2. Thus, an accident is more likely to occur in the clear zone than in APZ 1 or 2, and is more likely to occur in APZ 1 than APZ 2. The APZs for NAS Oceana and NOLF Fentress are the APZs presented in the 2005 JLUS Planning Map. These APZs illustrate the dominant flight tracks currently flown at each airfield.

A composite noise contour and APZ map has been developed and overlaid on an aerial photograph to show the AICUZ footprint for both NAS Oceana and NOLF Fentress. The AICUZ footprint shows the minimum acceptable area within which land use controls are recommended to protect the public health, safety, and welfare and preserve the defense flying mission. The AICUZ footprint for NAS Oceana and NOLF Fentress and the related land use planning accomplishments and Navy recommendations are fundamental tools for the continued success of the compatible land use planning model that has been in place in the Hampton Roads region of the last several years. In addition, an updated analysis of the number of people within the existing AICUZ footprint was conducted. Using census block-level population data and the boundaries of the AICUZ footprint, it is estimated that approximately 153,320 people live within the existing AICUZ contour.
Recognizing the need to balance community growth with the Navy’s mission, the Cities of Virginia Beach and Chesapeake have partnered with the Navy to develop various interrelated programs and initiatives to guide and control growth in the AICUZ footprint. These programs and initiatives, which in most cases began during development of the Hampton Roads JLUS through the Hampton Roads Planning District Commission in 2004 and 2005, have already lessened the Navy’s operational impacts on adjacent land, while simultaneously easing pressure on the Navy’s defense flying mission.

Control over land use and development in areas neighboring the airfields ultimately is the responsibility of local governments. The Navy, through its AICUZ Program, encourages local governments to plan for compatible development. Accordingly, City of Virginia Beach land use planning documents and zoning regulations identify existing and future land use and zoning in areas in the AICUZ footprint.

For example, the City prepared and adopted the APZ-1/CZ Master Plan (www.vbgov.com/Planning) in April 2005, as an amendment to the City’s Comprehensive Plan. This plan inventoried existing land use conditions within the NAS Oceana Clear Zone and APZ-1. Using public meetings for stakeholder input, the plan recommends future planned land use in the Clear Zone and APZ-1, noting both compatible and incompatible land uses (refer to the APZ-1/Clear Zones Locator Map and Future Planned Land Use maps on the following pages). The Lynnhaven SGA, Hilltop SGA, and Resort Area SGA Master Plans, adopted as amendments to the Comprehensive Plan, also recognize the AICUZ footprint and recommend future land uses accordingly. In addition, the City adopted the Interfacility Traffic Area (ITA) & Vicinity Master Plan (www.vbgov.com/Planning), as an amendment to the Comprehensive Plan in 2011. This plan guides future land use and development in Virginia Beach within the high noise zone contours between NAS Oceana and NAFL Fentress, and is further described in Chapter 1, Section 1.4 - Princess Anne Commons & Transition Area of this Policy Document.

The City’s AICUZ Overlay Ordinance regulates land use. AICUZ “Subareas” have also been designated by the City of Virginia Beach to correspond to high noise contours. Each of these subareas has associated land use density policies and use restrictions. The AICUZ areas and SubAreas are illustrated on the maps on the following pages.
Air Installation Compatible Use Zone (AICUZ) and Sub-Areas

Sources: Virginia Beach Dept. of Planning and Community Development; Virginia Beach Dept. of Communications and Information Technology Center for Geospatial Information Services, 2016
Disclaimer: Map current as of February 2016, for general information purposes only. Please see Appendix A for the complete map disclaimer and further information about this map.

For additional information please refer to the City of Virginia Beach Comprehensive Plan at: www.vbgov.com/planning
Noise Zones 65-70 dB DNL Sub-Areas

Sources: Virginia Beach Dept of Planning and Community Development, Virginia Beach Dept of Communications and Information Technology Center for Geospatial Information Services, 2016
Disclaimer: Map current as of February 2016, for general information purposes only. Please see Appendix A for the complete map disclaimer and further information about this map.

For additional information please refer to the City of Virginia Beach Comprehensive Plan at www.vbgov.com/Planning

Military Installations & Support/1-148
SPECIAL ECONOMIC GROWTH AREAS (SEGAs)

The City has designated 4 Special Economic Growth Area (SEGAs) on the Comprehensive Plan’s “Planned Land Use Map,” which are described in greater detail in Chapter 2, Section 2.4 - Economic Vitality. SEGAs are viewed as special areas with significant economic value and growth potential, with a primary consideration being adjacency to NAS Oceana or within the Interfacility Traffic Area high noise flight zone. The City supports development and redevelopment of this area consistent with the City’s AICUZ Ordinance provisions and the City’s economic growth strategy.

Three SEGAs were initially designated in the 2009 Comprehensive Plan:

1. SEG 1 – East Oceana
2. SEG 2 – West Oceana
3. SEG 3 – South Oceana

In 2011, when the Interfacility Traffic Area (ITA) & Vicinity Plan was adopted as an amendment to the Comprehensive Plan Policy Document, SEG 4 – Princess Anne Commons was subsequently designated. The recommendations pertaining to SEG 4 – Princess Anne are derived from the ITA & Vicinity Master Plan.

CITY-NAVY COOPERATION

The City’s APZ-1 Ordinance (adopted December 2005 and revised to include Clear Zones) amended the City’s Zoning Ordinance to prohibit all uses in APZ-1 and Clear Zones that are incompatible with OPNAV Instruction 11010.36B (the “OPNAV Instruction”). The APZ-1 Ordinance renders existing uses non-conforming but not incompatible, and requires all new development or redevelopment to be consistent with the OPNAV Instruction. As an exception, the Ordinance allows incompatible uses or structures as a replacement of the same use or structure, if the replacements use or structure is of equal or lesser density or intensity than the original use or structure. Where application of the APZ-1 Ordinance leaves property without a reasonable use, the APZ-1/Clear Zone Use and Acquisition Plan is intended to direct reuse, rezoning. The acquisition plan focuses on voluntary purchases of pre-existing, nonconforming properties within the APZ-1/Clear Zone that have been devalued by use restrictions, and/or whose owners desire to relocate such uses outside of the APZ-1/Clear Zones. The Plan also includes the voluntary acquisition of ITA and Rural Area AICUZ properties, as well as a program to manage and/or dispose of acquired properties in all acquisition areas. Through June 2014, the City acquired or contracted to acquire 758 residential dwelling units and 63 commercial units in APZ-1 and the Clear Zone.

The City-Navy Joint Review Process Group (JRP) informs the Planning Commission and City Council whether qualifying discretionary proposals, such as rezonings and conditional use permits, meet the requirements of the AICUZ Overlay Ordinance. The JRP meets as needed when rezoning applications are received by the City and consists of the following members:

- City Planning & Community Development Department Staff (JRP Coordination)
- City Attorney’s Office
- Director of Planning & Community Development
- Zoning Administrator
- NAS Oceana Planning Liaison
- NAS Oceana AICUZ Program Manager
The Department of Planning & Community Development routes all discretionary review applications within the "Area of Interest" map to JEB Little Creek-Ft. Story and to NAS Oceana within ALCUZ zones to their respective base Community Planning Liaison Officer (CPLO). The CPLO’s review comments are included in City staff reports to the Planning Commission.

The City’s YesOceana! Program was developed by the Department of Economic Development to meet the requirements of the Defense Base Closure and Realignment (BRAC) Commission to protect our citizens and keep NAS Oceana in Virginia Beach. This innovative program consists of zoning ordinances and economic incentives to foster the conversion of nonconforming businesses in the APZ-1 into conforming ones, and relocating ones that cannot be converted to another part of Virginia Beach. Program incentives include relocation assistance and BPOL Tax reduction. Not only does this approach accomplish necessary rollback, it ensures that redevelopment follows sound planning and land use principles and that any new development is of higher quality than what currently exists. For more information about this program, visit www.YesOceana.com.

**PARTNERSHIPS**

Since 2005, the City has established multiple partnerships with our military partners to advocate for the military presence in our community and associated economic development opportunities.

**Military Economic Development Advisory Committee (MEDAC)**

MEDAC was established to enhance the coordination with the local military and its various installation tenant commands. Members appointed by Virginia Beach City Council. Committee members are retired senior officers, retired senior enlisted personnel or qualified civilians having experience in the military warfare areas represented by the various local commands. MEDAC has four primary goals:

- Outreach to U.S. Navy and other military commands
- Economic development opportunities
- Workforce development
- Virginia Beach military affairs

**Oceana Land Use Conformity Committee (OLUCC)**

The City’s Oceana Land Use Conformity Committee makes recommendations to City Council and the Virginia Beach Economic Development Authority on the following matters:

- agreements and transactions that further the purposes for which the Committee was created;
- zoning and other land use ordinances, including the advisability of adopting new or amended ordinances;
- discretionary zoning applications, such as rezoning and conditional use permits;
- ordinances imposing fees or taxes, including the advisability of adopting new or amended ordinances; and,
- staffing and resources necessary, or appropriate, to assist the Committee in the exercise of its duties.

RECOMMENDED POLICIES

- Land uses situated in AICUZs should conform to all adopted plans (e.g., APZ-1/CZ Master Plan, ITA & Vicinity Master Plan, and the Strategic Growth Area Master Plans).

AGENDA FOR FUTURE ACTION RECOMMENDATIONS: Military Installations and Support

- Support the mission of the military installations in Virginia Beach. Continue to route to the Community Planning Liaison Officers (CPLOs) all discretionary and by-right development applications within "areas of interest." Work closely with the CPLOs in the review of development applications for "areas of interest" to avoid potentially incompatible uses.

- Continue to route to the CPLOs for review all discretionary and by-right development applications within "areas of interest" to avoid potentially incompatible uses.
ENDNOTES

1 Joint Expeditionary Base Little Creek-Fort Story. "Major East Coast Base Supporting Overseas Contingency Ops." Presentation for Planning Department – City of Virginia Beach, January 7, 2015.


A Study of Land Uses
Compatible with or Adjacent to
McCHORD AIR FORCE BASE
and
FORT LEWIS, WASHINGTON

FEBRUARY 28, 1992
Joint Land Use Study Team

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Printed on recycled paper
McChord AFB and Fort Lewis

JOINT LAND USE STUDY

Prepared for:
Pierce and Thurston Counties, Nisqually Indian Tribe, Cities and Towns of Lacey, Yelm, Rainier, Tacoma, Dupont, Steilacoom, Roy, Military Installations of McChord AFB, Ft. Lewis and Camp Murray.

February 28, 1992
This comprehensive land use study was prepared under contract with Pierce County with financial support provided by the Office of Economic Adjustment, Department of Defense. The content does not necessarily reflect the views of the Office of Economic Adjustment.
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JOINT LAND USE STUDY

EXECUTIVE SUMMARY

Joint land use means cooperative planning for compatible use of lands next to the military reservations. The goal of the Joint Land Use Study (JLUS) is to encourage compatible development and redevelopment of areas around the military installations that balances the needs of the communities with the military mission. The military mission is two fold: national defense and training of troops in preparation for national defense.

As population growth in Pierce and Thurston Counties occurs around the military installations, an issue emerges for both the military installations and surrounding communities. Can the military continue to fulfill its mission without threatening the activities of surrounding communities? Can growth occur adjacent to installations without threatening the ability of the military to continue its mission?

The Joint Land Use Study offers long-range and short-range strategies for coordinated land use. Operations on the installations or their direct effects extend beyond their boundaries. This is one of many environmental factors for consideration in long-range planning for land adjacent to the military installations. Although the Joint Land Use Study recommends military facilities operate in a manner considerate of their effects on surrounding communities, the Joint Land Use Study centers on civilian land uses.

Study participants are the military installations of McChord Air Force Base, Fort Lewis and Camp Murray and their neighboring civilian jurisdictions. Participating local governments include Pierce and Thurston Counties, the Nisqually Indian Tribe, as well as the cities and towns of Tacoma, Steilacoom, DuPont, Roy, Yelm and Rainier. The study area extends 1/2 mile from the installation boundaries, the 65 Ldn aircraft noise contour north of McChord AFB and Noise Zone II south of Fort Lewis.

Jointly funded by the United States Department of Defense and Pierce County, the scope of analysis was prescribed by the contract with the Department of Defense and concerns expressed at five public workshops conducted in Pierce and Thurston Counties. Topics include aircraft safety, aircraft noise; training and artillery/small arms safety, artillery noise, circulation, growth management and communication. The study presents relevant information necessary to generate recommendations on these topics. Issues beyond the scope of the study, but important to the workshop participants, are described and referred to agencies with jurisdictions for analysis and resolution.

Technical and Citizen Review Committees provided oversight, ideas, and refined the draft document and its recommendations. Technical Review Committee members represented the study participants. The Citizen Review Committee members represented geographic areas. Pierce County personnel worked as staff and facilitators of the committees as well as the contract manager. Pierce County staff assisted in the identification of issues, gathered data, policies and regulations; compiled the land use inventory; performed analyses of existing land use, zoning and compatible use guidelines; prepared maps and drafted the Study.

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The Study relies on existing information and studies, especially adopted policies and regulations of participating local governments, the McChord AFB Air Installation Compatible Use Zone Study (AICUZ) and the Fort Lewis Installation Compatible Use Zone Study (ICUZ). AICUZ and ICUZ studies identify the extent and location of aircraft and artillery noise, identify aircraft accident potential zones, present compatible land use guidelines for these areas, and recommend compatible uses.

Joint Land Use Study recommendations reflect concerns raised and arguments made at public meetings. Five public workshops were conducted in March and April of 1991 to identify issues and problems for citizens residing near the military installations. Public meetings were held in January, 1992 in five communities to review the draft Joint Land Use Study and its recommendations.

Implementation strategies set out the actions that individual local governments can take to achieve the recommendations. Responsibility for implementing the study's recommendations falls upon the individual jurisdictions, as well as the business community and private citizens. It is expected that each participating local government will review the recommendations and adopt provisions in a manner reflecting its own circumstances and community preferences. Consistency and coordination in implementation is urged to facilitate understanding and foster the cooperation of business and the general population.

The Study assumes that McChord AFB, Camp Murray and Fort Lewis will be an ongoing presence in Pierce and Thurston Counties, providing diversity to the employment profile. Military population is expected to remain relatively constant with periodic fluctuations. Eight thousand (8,000) more uniformed personnel are expected between 1991 and 1995. Although this is only 1,400 personnel over 1986 levels, it demonstrates the periodic fluctuations in population and employment that are likely. Projections of military population are difficult because of the rapidly changing defense policy of the country.

The civilian population growth rate is forecasted to be stable. The new Boeing plant in Frederickson is estimated to directly stimulate a 28,000 person increase in population. Northwest Landing in Dupont is expected to increase the population of Dupont from 495 to 15,000 people at full development. Approximately 100,000 more people are expected in Pierce County by the year 2010. Another 100,000 people are expected in Thurston County in the year 2010. As the two counties grow, development pressure near the installations will increase.

The installations provide fifty percent (50%) of their housing need at present. This enables many people to live off-installation. Within a 30-minute driving time of the installations are many cities and large urban areas. Pierce County alone has 22,600 apartment units, 6% which are vacant. Total housing units number over 238,000 including the cities. Pierce County has been adding approximately 1,500 new housing units per year.
Although affordable off-installation housing is an issue for military personnel and local communities alike, the JLUS did not undertake a detailed analysis of off-base housing. The issues of quality affordable housing for a fluctuating military population are referred to the housing task force of the Pierce County Comprehensive Plan update and its Thurston County counterpart.

The JLUS divides the question of compatible land use into issues related to Aircraft Safety, Aircraft Noise, Artillery Safety, Artillery Noise, Circulation, Growth Management, and Communication.

Aircraft safety discussion centers on two areas, the Clear Zone and two Accident Potential Zones. The Study focused on the zones north of McChord because the southern zones of McChord and those of Gray Army Airfield are fully contained within military boundaries.

The Clear Zone is 3,000 feet by 3,000 feet adjacent to the end of the runway. The Air Force found that 28% of all Air Force aircraft accidents occur in the Clear Zone. In this zone, residences are incompatible as are commercial and industrial uses that have people on site. The majority of existing land uses are incompatible. Zoning classifications allow for incompatible development.

The Joint Land Use Study recommends that the Air Force purchase the remaining 50.5 acres of privately held property in the Clear Zone of McChord AFB. If complete purchase is not authorized, then purchase of development rights is suggested. If that cannot be done, or until it can be accomplished, the study suggests that Pierce County prohibit new residential uses and other uses that concentrate people in the Clear Zone.

Accident Potential Zone I (APZ I) extends from just south of SR-512 to South 93rd Street, one-half block east of South Tacoma Way on the west, and Fife Street on the east. An estimated 1,666 people live in APZ I in 1,229 homes. Seven and eight-tenths percent (7.8%) of all Air Force aircraft accidents have occurred in this zone. Residences are considered incompatible here as are schools, medical facilities, and commercial and industrial uses that concentrate people on a development site. Existing Pierce County zoning does not discourage concentrations of people and permits residences at high densities.

Five percent (5%) of Air Force aircraft accidents have occurred in Accident Potential Zone II (APZ II). The McChord AFB Accident Potential Zone II is governed by Pierce County and by the City of Tacoma north of 80th Street. It stretches from South 93rd to 72nd Streets, one-half block east of South Tacoma Way on the west, and Fife Street on the east. Nearly 3,326 people currently live in 1,506 homes in APZ II. The Air Force advises that residences be low-density and that uses that attract concentrations of people be discouraged. Many mobile home parks as well as apartments and schools and established single family residential neighborhoods exist in the area.
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The JLUS study recommends that Pierce County and the City of Tacoma develop regulations that minimize incompatible uses and suggests that the regulations be consistent. The Study advises that Pierce County and the City of Tacoma officially declare the accident potential zones as accident potential areas for planning purposes. Landlords, referral agencies, sellers, realtors and lenders are asked to voluntarily include disclosure statements in rental and real estate purchase agreements. Finally, the study recommends that the business community lead the way in promoting voluntary programs.

In addition to aircraft safety concerns, these areas also have the highest aircraft noise levels. Whenever possible, takeoff occurs to the south so people are not affected. But prevailing winds result in 75% of departures to the north. The extra noise associated with departures from the north are caused by "takeoff thrust".

In the 1976 McChord Air Installation Compatible Use Zone Study, the Air Force mapped areas of very high aircraft noise and suggested land use compatibility guidelines consistent with what was used at other airports, civilian and military. The mapped areas are considered "noise sensitive areas" in the JLUS and include all areas lying between the 65 Ldn noise contour and McChord AFB. Aircraft noise contours extend across Pierce County and City of Tacoma. Gray Army Airfield contours at Fort Lewis and the southern exposure of McChord AFB fall within military installation boundaries.

Noise sensitive uses are uses of the land that involve activities that are interrupted by the presence of loud noise. Typical land uses sensitive to noise include schools, outdoor recreation, hospitals and other medical facilities, pasture lands, and residences. The Air Force has advised that uses adversely affected by high noise levels need to avoid these areas. In areas within the 65 Ldn noise contour, noise sensitive uses need noise insulation. In areas above 75 Ldn, residences should be avoided due to public health risks. The U.S. Department of Housing and Urban Development (HUD) suggests maintaining an interior noise level of 45 Ldn for noise sensitive uses, especially residences.

The Joint Land Use Study found that much residential zoning occurs in areas of extremely high aircraft noise. Other noise sensitive uses such as schools and churches are also located in areas of severe noise. Zoning as presently configured allows these incompatibilities to occur.

The JLUS recommends that Pierce County and the City of Tacoma adopt areas within the 65 Ldn noise contour as "noise sensitive areas". The study suggests that Pierce County and the City of Tacoma coordinate amendments to their policies and regulations to be consistent with land use compatibility guidelines. The Study recommends that Building Codes implement HUD standards by requiring construction that reduces aircraft noise inside noise sensitive uses to 45 decibels. Integration of noise attenuation with housing assistance programs is advised as well as looking into a program to assist with insulating existing noise sensitive uses. Voluntary disclosure of noise effects by landlords and real estate related businesses is suggested. Local governments are asked to provide information to the public on how to remodel businesses and residences for aircraft noise reduction.

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The military is asked to construct noise barriers, monitor flight patterns, perform engine runups where the fewest residences are affected, and use aircraft with quieter engines. Finally, when new noise contours are drawn, the study recommends that affected people be notified.

Fixed-wing aircraft noise contours are fully contained within Fort Lewis boundaries, however, helicopter noise was noted as affecting residents and animals. Because helicopter operations do not have standardized flight tracks, they are not included in aircraft noise contours. Helicopters abide by Federal Aviation Administration (FAA) and Army regulations. Where permitted, they pass over civilian property at an altitude of 2,000 feet. Avoidance areas are maintained over residential areas especially. Eighty-two percent (82%) of the flights occur in the day (before 10 p.m.). The number of flights has shifted with troop assignments. In 1988, 200 helicopters performed 400 missions daily. Now there are only 25 helicopters. An increase to 180 helicopters is expected to substantially increase the number of helicopter operations to near levels before the inactivation of the 9th Infantry.

The JLUS recommends that the Army continue to monitor noise sensitive areas and adjust avoidance areas as needed to minimize adverse effects. The study suggests that the military buffer areas be increased for night operations, both in altitude and horizontal distance. The military is encouraged to use quieter helicopters.

The major noise sources for Fort Lewis are weapons firing and operation of military aircraft. Fort Lewis is required to accommodate larger, technologically more complex, longer-range weapons. This can mean placing firing points near installation boundaries to guarantee safe and secure impact areas. All firing ranges have specific limitations on the type of weapons which can be fired and the direction in which the weapons can be fired. Improving combat readiness means training soldiers more frequently, with effects on adjacent communities. For the Army, such sound levels are both part of the job of operating a defense weapons system and a necessary training condition.

Local governments need to ensure that development of areas near the Fort is compatible by using effective planning and development principles. Noise sensitive land uses should be located away from noise sources.

In 1988, the ICUZ Study looked at the effects of Fort Lewis operations on surrounding communities, drew blast impact noise contours and described compatibility zones. Three noise zones were mapped. In Noise Zone I, noise is considered moderate and acceptable for noise sensitive uses. This does not mean that there is no loud artillery noise but that the average sound level is low according to the projections provided by the Army. In Noise Zone II, there is significant noise exposure. Noise sensitive uses are generally unacceptable without noise insulation of the building and careful site design. In Noise Zone III, noise is severe and unacceptable for noise sensitive uses. Noise Zone III is the immediate area of the blast impact.
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The Zone II contour for blast noise extends slightly off-post in the vicinity of the Nisqually Indian Reservation. Otherwise, all noise zones of consequence currently lie within the installation. However, the Army suggests that local governments take precautions in deciding how the area develops. To take into consideration the likelihood of severe noise they advise keeping noise sensitive uses from locating along the perimeter of the installation.

The JLUS recommends that the Army periodically measure actual noise events, vibration and concussion effects, recalibrate the model that identifies the noise zones accordingly and produce updates of the ICUZ study so that information is current and accurate. The Study recommend updates of the ICUZ study when missions change but not less than every three years. The Army is asked to measure and provide information to local governments on citizens on single event noise levels.

Local governments are asked to provide information to residents on how to reduce noise in building remodels and new construction. Pierce County, Thurston County and the Nisqually Tribe are asked to coordinate land use regulations that incorporate compatible land use recommendations including the noise contours and locate noise sensitive uses away from Fort Lewis boundaries. They are also asked to ensure that new construction in Noise Zone II reduce interior noise levels to the 45 decibel HUD standard. Disclosure statements are recommended for both public and private agencies and individuals.

Artillery fire, use of flares and rockets, and campfires can be dangerous during the summer months and other dry periods. Citizens at public workshops expressed concern that fires started on-post could spread off-installation to residential areas putting people at risk. In some cases residences are located within 50 feet of installation boundaries near training areas.

Cooperative mutual aid agreements exist between the installations, civilian fire districts and police. Nevertheless, the JLUS study recommends that the military restrict fire-prone activities during dry weather. The Study suggests making sure that training areas are accessible by fire fighting equipment, that training areas are designed to prevent spread of wild fire off-post, and that structures being built on lands adjacent to Fort Lewis provide fire separation from the Fort's boundaries.

There were four main circulation issues identified for evaluation: contribution to local and regional traffic congestion, reservation geography as a subregional traffic barrier, congestion at gates, and gate and road closures.

The military installations use the civilian road network for troop and material transport and to carry commuter traffic. Congestion on roads surrounding the installations is created less by the installations and more by civilian growth in the vicinity which removes capacity from area roads. In the last three years, personnel levels have been low yet congestion increases.
Convoys are scheduled only in off-peak hours to avoid causing traffic congestion and they use less traveled roads whenever possible. No evidence was uncovered to support the suggestion that convoys are a problem.

The JLUS recommends that the installations participate in transportation system demand management programs, transit, carpools, and related programs. The federal government is asked to participate in the design and funding of transportation improvements to the extent that the installations contribute to the problem. Off-base transportation needs are suggested to be evaluated periodically by the installations and that information be shared with local governments. The study recommends that a high priority be given to street improvements that reduce congestion in the vicinity of the installations. Finally long-range transportation planning should consider the military's long term need and include the military in plan development.

As Pierce County develops pressure is mounting for a cross-base transportation corridor to link Tacoma and Lakewood with Spanaway, Frederickson and Bethel areas. The Transportation Division of Pierce County Public Works has contracted for a study of alignment and design alternatives. The study is due to be completed in April, 1992 public meetings will be held on the study's recommendations.

The military installations have stated that any cross-base corridor needs to address the following concerns; interference with installation activities, restricted military access both at Fort Lewis and McChord AFB, noise-insulating berms and other design features near on-installation housing, and road closure of unsecured cross-installation roads. Much of the traffic using a new route is projected to be generated from the installations.

The JLUS recommends that cross-installation roads be developed in accordance with civilian and military transportation plans, based on projected need, environmental constraints, and meet the needs of the military installations. The study suggests that cross-installation routes accommodate non-motorized transportation needs, such as bicycles, as a form of transportation system demand management.

Gate congestion occurs when security conditions arise. Although there has been little gate congestion in the last couple of years, with the increase in personnel projected for 1994 and 1995, gate congestion is likely to increase.

The JLUS recommends that as freeway interchanges are improved, they be redesigned to reduce the effect of gate congestion on the freeway. The study also advises that the military and local governments collaborate on solutions to gate congestion.
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Military installation roads and gates get closed for national security, base security and other reasons. The federal government owns the military installations and the road system. Access to schools, to other roads, to jobs and the like, that pass through military grounds may not be continuous. People choose to live in a certain area because of the road system available at the time. When closures occur, they affect people who have grown to rely on them. Land uses and public services delivery are planned assuming uninterrupted use of the installation roads.

Choices on service delivery routes and land uses need to be based on access routes that are owned and controlled locally. People need to make informed choices. In order for that to occur, information on real conditions must be made available to the public.

The JLUS suggests that a public information program provide information to citizen communities on security requirements and what can happen to federal roads under certain conditions. It also advises local governments and service providers to plan on service delivery on the basis of the public transportation network to meet access needs. Finally it suggests that mitigation plans be developed for road closures.

Updates of the Comprehensive Plans of Pierce and Thurston County and their cities is required by the Growth Management Act. In order for military installations to get their needs met, active participation in development of these plans is imperative.

JLUS recommends establishing a regular meeting between the military commanders and local and federal officials on topics of mutual concern. It suggests inviting the military to participate on growth management committees. It also suggests incorporating the military installations into the local environmental review processes.

In lieu of a third runway at Sea-Tac airport, a supplemental airport has been considered. Locations under review is joint use of McChord AFB and a site in East Fort Lewis. In order for this to occur, additional runways would have to be constructed. Other effects would be infringement on Fort Lewis and McChord training exercises, difficulty with installation security, interruption of civilian service during national emergencies, and increased aircraft noise and accident potential for the citizens of Pierce County and the City of Tacoma.

The JLUS recommends that local governments oppose use of active military facilities for a commercial airport.

Joint land use cannot be balanced without good communications. Residents around the installations need to make the installations aware of how they are feeling and the military needs to inform citizens of training activities and similar events that effect their lives. The installations have requirements and needs as well that should be shared with civilians.
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The JLUS recommends expanding the current public information program to include more newspaper and television coverage, provide forms for citizen complaints and conduct periodic opinion surveys. The members of the news media are encouraged to place a high priority on military news.

Recommendations of the Joint Land Use Study to reinforce a harmonious relationship between the military and surrounding communities. The extent to which compatible land use ensues depends on the willingness of all parties to communicate openly and respect each other needs. All of the participating jurisdictions committed to respect the study findings and to consider implementation of applicable recommendations. A model adoption Resolution is contained in Appendix A.
JOINT LAND USE STUDY

RECOMMENDATIONS

AIRCRAFT SAFETY

Issue #1:  Land still under private ownership in Clear Zone

RECOMMENDATIONS

1. The Department of Defense should purchase in fee simple all property in the McChord AFB Clear Zone, supported actively by local government.

2. If fee simple purchase is not possible, the military should purchase the development rights in the Clear Zone.

3. Until acquisition of the Clear Zone occurs, Pierce County should restrict development and other land uses that assemble concentrations of people in the McChord AFB Clear Zone as follows:
   a. Prohibit new residential development.
   b. Encourage the relocation of existing residents to locations where land use is compatible with Joint Land Use Study recommendations.
   c. Permit industrial, manufacturing, and warehouse uses with fewer than an average of 25 people per hour/acre in a 24-hour period and noise reduction construction in public areas which meets the United States Department of Housing and Urban Development (HUD) standards.
   d. Allow low-intensity uses such as mining; cemeteries; agriculture, except livestock; open-space; and utilities.

4. Until acquisition of the Clear Zone occurs, Pierce County should prohibit the following land uses:
   a. Any use which involves release of airborne substances, such as steam, dust, and smoke which interfere with aircraft operations.
   b. Any use which emits light, direct or indirect (reflections), which interfere with pilot’s vision.
   c. Any use which emits electrical currents which may interfere with communication systems or navigational equipment.
   d. Any use which attracts birds or waterfowl [i.e., sanitary landfills, feeding stations, and the growth of certain vegetation].
   e. Any use which would have structures within 10 feet of aircraft approach-departure and/or transitional surfaces.

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5. For proposed new development in the Clear Zone, environmental checklists should be referred to the McChord AFB Commander for comment prior to threshold determination.

6. Puget Power and other utilities should work to eliminate all above-ground transmission lines within the Clear Zone.

7. Pierce County should support open-space tax exemptions for qualified properties in the Clear Zone.

**Issue #2: Incompatible land uses in the Accident Potential Zones**

**RECOMMENDATIONS**

1. Pierce County should develop regulations that minimize incompatible uses in Accident Potential Zone I as follows:
   a. Prohibit any new residential development.
   b. Prohibit any new use which involves release of airborne substances, such as steam, dust, and smoke which interfere with aircraft operations.
   c. Prohibit any new use which emits light, direct or indirect (reflections), which interfere with pilot’s vision.
   d. Prohibit any new use which emits electrical currents which may interfere with communication systems or navigational equipment.
   e. Prohibit any new use which attracts birds or waterfowl [i.e., sanitary landfills, feeding stations, and the growth of certain vegetation].
   f. Prohibit any new use which results in a concentration of people, more than an average of twenty-five (25) people per hour/acre in a 24-hour period.

2. Pierce County and the City of Tacoma should coordinate land use regulations developed to minimize land use incompatibilities in Accident Potential Zone II (APZ II) as follows:
   a. Prohibit any new use which involves release of airborne substances, such as steam, dust, and smoke which interfere with aircraft operations.
   b. Prohibit any new use which emits light, direct or indirect (reflections), which interfere with pilots vision.
   c. Prohibit any new use which emits electrical currents which may interfere with communication systems or navigational equipment.
   d. Prohibit any new use which attracts birds or waterfowl [i.e., sanitary landfills, feeding stations, and the growth of certain vegetation].
   e. Prohibit any new use which results in a concentration of people, more than an average of twenty-five (25) people per hour/acre in a 24-hour period.
   f. Prohibit any new development or redevelopment which results in an increase in density or intensity of current development.

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3. For development proposals in Accident Potential Zones I & II, environmental checklists should be referred to the McChord AFB Commander for comment prior to a threshold determination.

4. New churches, schools, libraries, and similar buildings that concentrate people should not be located in Accident Potential Zones I or II.

5. Pierce County and the City of Tacoma should adopt Aircraft Accident Potential Areas as identified in the McChord AFB Air Installation Compatible Use Zone Study (AICUZ).

6. Upon adoption of accident potential zones, landlords, housing referral agencies, real estate agents, sellers, and lenders should include disclosure statements in rental agreements and purchase agreements.

7. Local governments should encourage the business community to lead the way on a voluntary program to remove land use conflicts in the Accident Potential Zones.

8. The military installations should update the Fort Lewis Installation Compatible Use Zone Study (ICUZ) and the McChord AFB Air Installation Compatible Use Zone Study (AICUZ) as missions change or land use compatibility standards change, but not less than every three (3) years in order to allow local jurisdictions to implement the Joint Land Use Study recommendations.

AIRCRAFT NOISE

Issue #1: Noise sensitive land uses are allowed to develop in areas of very high aircraft noise

RECOMMENDATIONS

1. Pierce County and the City of Tacoma should adopt the area within the 65 Ldn noise contour shown in the McChord AFB Air Installation Compatible Use Zone Study (AICUZ) as "aircraft noise sensitive" areas in local Environmental Regulations. Aircraft noise sensitive areas should be updated when new noise contours are identified in amendments to AICUZ.

2. Pierce County and the City of Tacoma should coordinate land use regulations developed for the Aircraft Noise Sensitive Areas.

3. Pierce County and the City of Tacoma should insure that Building Codes reduce aircraft noise transmissions through the building envelope to meet

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the United States Department of Housing and Urban Development (HUD) standards.

4. Upon adoption of "aircraft noise sensitive" areas, landlords, housing referral agencies, real estate agents, sellers, and lenders should include disclosure statements in rental agreements and purchase agreements for properties in "aircraft noise sensitive" areas.

5. Policies and regulations for land use actions within the 65 Ldn noise contour should be reviewed for consistency with the McChord AFB Air Installation Compatible Use Zone Study (AICUZ) and the Fort Lewis Installation Compatible Use Zone Study (ICUZ) recommended guidelines.

6. Pierce County and the City of Tacoma should explore obtaining federal funding for aircraft noise reduction when remodeling buildings within the 65 Ldn noise contour, consistent with the Department of Housing and Urban Development (HUD) standards.

7. All affected parties should be notified when 65 Ldn noise contours are revised.

8. Pierce County should adopt regulations in the 75-80 Ldn noise contour as follows:
   a. Permit no new residential development.
   b. Permit no day care facilities, schools or other facilities which incorporate outside activities.
   c. Permit low intensity uses such as golf courses.
   d. Permit manufacturing; cultural facilities such as auditoriums, public meeting facilities, theaters; and medical facilities when the building envelope reduces aircraft noise transmissions to the Department of Housing and Urban Development (HUD) standards.

9. The military should evaluate construction of sound barriers and construct where found as effective sound management techniques.

10. The military should continue to monitor and evaluate flight patterns to reduce land use incompatibility.

11. Local governments should provide information to the public on how to achieve aircraft noise reduction when remodeling buildings.

12. The military should continue to employ technological advancements in quieter aircraft.

13. The military and local governments should investigate integrating noise attenuation with existing housing assistance programs within the 65 Ldn noise contour.

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14. The Department of Defense should periodically measure actual aircraft noise levels at McChord AFB and Gray Army Airfield at Fort Lewis, recalibrate noise models to reflect actual conditions, and reconfigure noise contours in the McChord AFB Air Installation Compatible Use Zone Study (AICUZ) and the Fort Lewis Installation Compatible Use Zone Study (ICUZ) based on the findings.

15. Aircraft noise should be measured near Pacemaker Airstrip in eastern Fort Lewis with findings and recommendations included in future updates of the Fort Lewis Installation Compatible Use Zone Study (ICUZ).

**Issue #2:** Helicopter noise affects residents and animals

**RECOMMENDATIONS**

1. The military installations should continue to monitor areas sensitive to helicopter noise and modify corresponding avoidance areas and required flight altitudes.

2. The military installations should continue to regularly brief their pilots and monitor corresponding avoidance areas and required flight altitudes.

3. Local governments should encourage the military to explore new technologies to reduce helicopter noise emissions.

4. The military should increase buffer areas during night operations by both height and horizontal measurements.

5. The military should modify their definition of night time operations to replace the beginning time of 10 p.m. with "7 p.m. or End of Evening Nautical Twilight (EENT), whichever comes later".

6. Local governments adjacent to the military installations should regularly advise citizens of helicopter activity in the area.

**Issue #3:** Touch-and-go landings, ground run-ups and nighttime flying are major causes of noise irritation

**RECOMMENDATIONS**

1. Dismounted engine run-ups should continue to occur in special sound buffered test facilities.
2. Mounted aircraft engine run-ups should continue to occur as far away as possible from residential areas and noise sensitive land uses; or where topography reduces noise.

3. Simulation training should be increased to decrease noise problems.

4. The military should develop public information programs to explain the need for training flights, ground run-ups and nighttime flying.

5. The military should continue to schedule night operations at remote locations when feasible.

**TRAINING AND ARTILLERY/SMALL ARMS SAFETY**

**Issue #1:** Danger to civilian property from fires started on-base

**RECOMMENDATIONS**

1. Insure civilian and military fire fighting equipment have access to military training areas.

2. The military should continue to monitor fire risks related to training activities to prevent fire risks off-installations.

3. Future construction adjacent to the installation should provide for fire protection at Fort Lewis boundaries.

4. The Department of Defense should develop noise contours to reflect single-noise levels starting at 45 decibels, using five (5) decibel increments.

**ARTILLERY NOISE**

**Issue #1:** Residents surrounding Fort Lewis are affected by artillery and small arms noise

**RECOMMENDATIONS**

1. The military should periodically measure actual impulsive noise levels at Fort Lewis, recalibrate noise models to reflect actual conditions, and reconfigure noise contours in the Fort Lewis Installation Compatible Use Zone Study (ICUZ) based on the findings.

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2. Fort Lewis should update the Installation Compatible Use Zone Study (ICUZ) when there is a mission change or land use compatibility standards change, but not less than every three (3) years to allow local jurisdictions to implement the Joint Land Use Study recommendations.

3. Local governments should provide information to the public on how to achieve noise reduction when remodeling buildings.

4. The Nisqually Indian Tribe and Thurston County should adopt as "noise sensitive" areas in local Environmental Regulations areas such as the Noise Zone II (NZ II) noise contour.

5. Local governments should insure that Building Codes reduce artillery noise transmissions through the building envelope to meet the Department of Housing and Urban Development (HUD) standards in "noise sensitive" areas.

6. Upon adoption of "noise sensitive" areas, landlords, housing referral agencies, real estate agents, sellers, and lenders should include disclosure statements in rental agreements and purchase agreements in "noise sensitive" areas.

7. Affected jurisdictions should incorporate the Installation Compatible Use Zone Study (ICUZ) noise contour maps and the "Recommended Land Uses for Installation Compatible Use Zone (ICUZ) Program Noise Zones" for Noise Zone II.

8. Affected jurisdictions should prohibit the following land uses within Noise Zone II:
   a. New residential uses, unless the design of the structure and general site plan incorporate noise reduction measures to meet the Department of Housing and Urban Development (HUD) standards.
   b. Public services and quasi-public services such as hospitals, public meeting rooms, and libraries, and cultural, recreational and entertainment land uses unless the design of the structure and general site plan incorporate noise reduction measures to meet HUD standards.
   c. Schools, day care facilities, and other facilities which incorporate outside activities.

9. The military and local jurisdictions should develop and adopt programs which encourage preservation of natural vegetation for aesthetic and noise attenuation purposes.

10. The Department of Defense should measure actual artillery-related vibration and concussion levels in areas surrounding the Fort Lewis, map impact areas based on the degree of effect, and include this information in
subsequent updates of the Fort Lewis Installation Compatible Use Zone Study (ICUZ).

11. Firing point noise should be incorporated into noise measurements and be described and mapped in the next update of the Fort Lewis Installation Compatible Use Zone Study (ICUZ).

12. Local governments adjacent to Fort Lewis should direct the following land uses away from property abutting the installation boundary:
   a. High-density residential.
   b. Public buildings (such as schools, medical facilities, public meeting facilities, and churches).
   c. Cultural facilities.

CIRCULATION

Issue #1: Contribution to local and regional traffic congestion

RECOMMENDATIONS

1. The military should cooperate with local governments to develop transportation demand management programs.

2. The military installations should assist in the analysis and planning of transportation improvements to accommodate traffic generated from military activities.

3. Transportation funding sources should be asked to give special consideration to funding transportation projects that support the military mission.

4. Encourage local jurisdictions to place a high priority on transportation improvements that reduce congestion in the vicinity of military installations.

5. The Regional Transportation Plan and all other transportation plans should consider the military's projected long-term transportation needs.

6. The military should provide information on their long-term transportation needs to the local governments.

7. The Puget Sound Regional Council should include the military as a member of the Regional Transportation Plan Policy Board.

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Issue #2: Military Installations as a Subregional Traffic Barrier

RECOMMENDATIONS

1. Cross-base corridors, when constructed, should be developed in accordance with affected civilian and military installation transportation plans.

2. The viability of cross-base corridors (arterial or highway) should be determined on the basis of detailed studies of population projections, military mission, land availability, land use projections, and environmental analysis of alternative routes and corridors.

3. Cross-base corridors should consider accommodating non-motorized transportation, including bicycles and mass-transit alternatives; when consistent with local and regional comprehensive plans and military master plans.

Issue #3: Congestion at gates

RECOMMENDATIONS

1. As freeway interchanges are improved, they should be redesigned to reduce congestion resulting from installation access control.

2. Local governments and the military should jointly consider solutions to gate congestion that enhance the flow of traffic to and from the installations.

Issue #4: Military Gate and Road Closure

RECOMMENDATIONS

1. The military should use public information programs to inform citizens near the installations how the military security requirements can effect roads.

2. Local governments should plan public services, transportation, land use, and other decisions on the ability of the public transportation network to meet access needs without depending on military roads.

3. Local governments and the military should cooperate on the development of mitigation plans for military road closures that affect public use.
GROWTH MANAGEMENT

Issue #1:  Growth Management and Coordination of Land Use

RECOMMENDATIONS

1. Local governments should strongly consider the military installations as an affected agency for land use planning decisions.

2. Local governments should invite the military to participate as members on growth management committees.

3. Local governments should provide opportunities for the military to participate in local and regional planning issues and programs.

4. The military should actively participate in local growth management committees and programs.

5. The military installations and local governments should establish periodic meetings of elected local, state and federal officials and military commanders on growth management issues of mutual concern.

6. The military should consistently provide statistical data to civilian planners for developing land use, housing, and transportation plans.

7. A standing review committee, comprised of representatives from Joint Land Use Study participating jurisdictions, should be formed to meet and be briefed on major development proposals and environmental concerns on and off the installations.

8. Environmental policies adopted by the military should continue to reinforce the environmental policies of surrounding jurisdictions.

9. Comprehensive Plan policies adopted by local governments pertaining to environmental issues, should agree with and not degrade the environmental policies of the military installations.

10. The military and local jurisdictions should develop and adopt programs to encourage preservation of natural vegetation for aesthetic and noise attenuation purposes.

February 28, 1992
Recommendations

Issue #2:  Sea-Tac Auxiliary Airport

RECOMMENDATIONS

1. Local governments should oppose future use of military facilities for a commercial airport.

COMMUNICATION

Issue #1: Collaboration between military and local residents, communities and local governments on issues of mutual interest

RECOMMENDATIONS

1. The military should expand their existing public information program to include the following methods of informing local residents and receiving their comments:
   a. submit articles to local newspapers;
   b. submit information for display on "public access" television channel;
   c. conduct periodic surveys for public opinion;
   d. provide information boards;
   e. provide comment forms for citizen's complaints;
   f. explore extending Fort Lewis cable channel to adjacent communities.

2. Encourage local news media to place a higher priority on routine military functions that have an impact on the surrounding communities and land uses.

3. The Yelm Chamber of Commerce is encouraged to form a "military affairs committee" to aid in the communication and public awareness of Fort Lewis range activities and schedules.
GLOSSARY

Accident Potential Zone I (APZ I): A zone mapped by the Air Force 3,000 feet wide by
5,000 feet long extending from the Clear Zone. An accident is less likely to occur in
APZ I than in the Clear Zone, but a significant risk factor still exists.

Accident Potential Zone II (APZ II): A zone mapped by the Air Force 3,000 feet wide
by 7,000 feet long. An accident is less likely to occur in APZ II than APZ I, but it still
possesses some risk.

Air Installation Compatible Use Zone (AICUZ): An Air Force program which
measures and maps noise and accident potential resulting from normal military
operations. Using this data, AICUZ recommends compatible land uses within the
various Compatible Use Districts identified.

Attenuation: Acoustical phenomenon whereby a reduction in sound energy is
experienced between the noise source and receiver. The energy loss can be attributed to
atmospheric conditions, terrain, vegetation, man-made features, and natural features.

A-weighted Sound Level: The sound pressure level in decibels as measured on a sound
level meter using the A-weighted network. The A-weighing scale closely resembles the
frequency response of human hearing, and therefore, provides a good indication of the
impact of noise produced from transportation activity.

Clear Zone: An area 3,000 feet by 3,000 feet extending outward from the runway
threshold. The accident potential is so high within this area that development of any
kind on the land is recommended to be prohibited.

Compatible Land Use: A use of land identified in AICUZ and ICUZ as normally
compatible with the aircraft and artillery noise levels or accident potential characteristics
of the area in which the land use is situated.

Compatible Use Districts: A series of districts which are defined by aircraft noise
exposure and accident potential near United States Air Force airfields.

C-weighted Sound Level: The sound pressure level in decibels as measured on a sound
level meter using the C-weighted network. The C-weighted measures the low frequency
component of a noise that can cause building and windows to shake and rattle and which
is an important ingredient in a person’s perception of the annoyance from blast (artillery
and small arms fire) activities.

Decibel(dB): A unit for measuring the relative loudness of noise. One decibel is
comparable to the weakest sound that can be heard by a person with very good hearing
in an extremely quiet room.

February 28, 1992
**Impulsive Noise:** Noise of short duration of high intensity, abrupt onset and rapid decay, often with rapidly changing spectral composition. Impulse noise is characteristically associated with such sources as explosions, impacts and the discharge of firearms.

**Installation Compatible Use Zone (ICUZ):** An Army program which measures and maps noise and resulting from normal military operations. Using this data, the Army recommends compatible land uses around the installation.

**Induced Consumption Spending:** Changes in consumption spending resulting from government spending.

**Ldn (Day-Night Average Sound Level):** A measurement of aircraft noise based on the annual average daily noise levels in decibels. Ten (10) decibels is added to the level of noise occurring between 10 p.m. and 7 a.m.

**Noise Level Reduction (NLR):** Difference in decibels, between the noise level outside a building and the noise level inside a designated room in the building that was caused by exterior noise.

**Noise Sensitive Use:** Land uses whose normal daily activities are interrupted or upset by a high amount of noise. They may include but are not limited to homes, schools, professional offices, hospitals, outdoor recreation, and libraries.

**Noise Zone I:** A noise contour utilized by the Army. It contains an area where the day-night average sound level is 62 decibels C-weighted (dBC). This area, considered to have moderate to minimal noise exposure, is acceptable for noise sensitive land uses including housing, schools and medical facilities.

**Noise Zone II:** A noise contour utilized by the Army. It contains an area where the day-night average sound level is between 62 and 70 decibels C-weighted (dBC) DNL. This area is considered to have a significant noise exposure and is normally unacceptable for noise sensitive land uses.

**Noise Zone III:** A noise contour utilized by the Army. It contains an area where the day-night average sound level is greater than 70 decibels, C-weighted (dBC). This zone is considered an area of severe noise exposure and is unacceptable for noise sensitive land uses.

**Single Noise Event:** An occurrence of audible noise usually above a specified minimum noise level caused by an intrusive source such as an aircraft overflight, passing train, or ship’s horn.
CHAPTER 1
WHAT IS THE JOINT LAND USE STUDY?

PROGRAM DESCRIPTION

The Joint Land Use Study (JLUS) is a collaborative planning effort involving the military installations of Fort Lewis, McChord Air Force Base and Camp Murray (Washington National Guard) and ten local governments surrounding these military installations. Its broad goal is to encourage each jurisdiction to practice compatible development and redevelopment in each affected jurisdiction that balances sustaining the local military missions with long-term community land use needs. Compatible land use means land use identified in AICUZ and ICUZ as normally consistent with the aircraft activity and artillery noise levels or accident potential characteristics of the area in which the land use is situated.

RELATIONSHIP OF AIR INSTALLATION COMPATIBLE USE ZONE STUDY (AICUZ) AND INSTALLATION COMPATIBLE USE ZONE STUDY (ICUZ) TO THE JOINT LAND USE STUDY (JLUS)

The goal of the JLUS stated above is echoed in both the Air Force’s Air Installation Compatible Use Zone (AICUZ) and the Army’s Installation Compatible Use Zone (ICUZ) programs. AICUZ and ICUZ are programs designed to measure and map public safety issues such as noise and accident potential resulting from normal military operations. This information is then used to recommend compatible land uses to local governments in areas likely to be impacted by air and land operations and training. Both McChord Air Force Base (1976) and Fort Lewis (1988) have issued AICUZ and ICUZ studies respectively. To encourage implementation of AICUZ recommendations, the Air Force initiated the JLUS funding program in 1985.

ELIGIBILITY

The JLUS program provides technical and financial assistance for civilian study of land use guidelines as they relate to military operations. Certain requirements are considered by the Air Force when selecting locations to be eligible for JLUS assistance. Among these requirements are the following:

a) Demonstrated ability to work with local governments
b) Potential for incompatible growth in areas potentially affected by the bases
c) Base commitment to support JLUS effort
d) Existence of state enabling legislation for planning around airfields.
Chapter 1
What is the Joint Land Use Study?

Senior Air Force installation personnel holds primary responsibility for determining eligibility and submitting their base for JLUS candidacy through their headquarters.

CONSENSUS BUILDING

An important standard to measure financing the JLUS is the ability to build a community consensus. The Air Force measures this qualification by asking that:

Each local governing body within the JLUS area must be in agreement with the need for compatible growth in communities around the airfield. If the JLUS is to have positive results, the communities must also agree to adopt those measures needed to achieve compatible growth.¹

Consensus-building is normally spearheaded by one jurisdiction designated to act as lead agency. During the eligibility study phase, Pierce County Planning and Land Services staff developed goals and objectives, proposed techniques for public involvement, established a scope of work and solicited letters of support from other affected jurisdictions. A preliminary budget framework was also formulated.

Using all available information, local commanders nominate their respective installations for the JLUS program. A select number of candidate installations are forwarded each year to the Office of Economic Adjustment (OEA) in the Office of the Secretary of Defense for final selection. Once a local lead agency is designated, the OEA assists the JLUS participants with grant application and contract management. The lead agency acts for all participating local governments and is the co-signatory (along with OEA) on the final contract.

PARTICIPANTS

The decision to include Fort Lewis (Army) and Camp Murray (Washington National Guard) with the McChord Air Force Base Joint Land Use Study was based on a common recognized need. Collectively, the three military installations form a large contiguous block straddling Pierce and Thurston Counties. Strong strategic and operational links contribute to the military installations' importance in planning. Consequently, internal boundaries between them have been largely ignored for the purpose of this study.

In addition to Pierce and Thurston Counties, the cities and towns of Tacoma, Steilacoom, DuPont, Roy, Yelm, Rainier and Lacey and the Nisqually Indian Reservation either share a border with one or more of the installations, or realize some level of impact from the military presence. Pierce County was designated as lead agency and coordinated early planning sessions. Letters of concurrence received from participating jurisdictions are included in Appendix B.

Chapter 1
What is the Joint Land Use Study?

GOAL OF THE STUDY

Consistent with the broad aims of the Joint Land Use Study concept, the McChord-Fort Lewis-Camp Murray study has the following goal:

*Encourage each jurisdiction to practice compatible development and redevelopment of the areas surrounding the installations that balances military mission requirements with community needs.*

A degree of certainty is sought for surrounding communities as well as for the military, in order that operations can be planned and land use regulations crafted in an environment of relative predictability.

While the focus is land use, related opportunities for increased collaboration are identified. Recommendations are offered for long-range mechanisms to facilitate cooperation on issues of mutual interest. Previous Joint Land Use Studies have concentrated on the development of land use compatibility recommendations surrounding Air Force bases. Aircraft noise and safety issues dominated other studies, and are a major component of this study.²

With the inclusion of Fort Lewis and Camp Murray, the list of land use conflicts has lengthened. For example, noise impacts from heavy artillery and light arms fire training are perceived by the public as detrimental to their health and safety. Conversely, the encroachment of residential development to the edge of Fort Lewis restricts the Army's ability to train effectively without complaints from nearby residents. This and other conflicts are examined in Chapter 4.

Limits of the JLUS in Implementing the Goal: While the JLUS recommends certain courses of action, it does not regulate nor does it immediately become part of any comprehensive plan. Each participating jurisdiction must decide which JLUS recommendations are applicable to their needs. Implementation at the discretion of the elected officials in each jurisdiction and the respective military commands will follow the issuance of the final recommendations.

BASELINE FOR STUDY

The following define the baseline for the study:

a) Joint Land Use Study recommendations will be based on peacetime operational levels.

b) The study is based on current population, types of military activities and military operational level, while acknowledging periodic fluctuations.

² See the Joint Land Use Studies for Williams AFB and Luke AFB in Maricopa County, Arizona, the Comprehensive Land Use Plans (CLUP) for Castle AFB, Beale AFB, McChin AFB and Mather AFB in California and the Comprehensive Airport Land Use Plan for Travis AFB, in Solano County, California.
c) Area-wide population growth rate will remain stable.
d) The entity creating the problem and the entity affected by the problem are responsible to work with each other to solve the problem.
e) Implementation will follow the issuance of the final recommendations in March 1992, at the discretion of the elected officials in each jurisdiction and respective military commands.
f) The military encourages good relations with neighboring jurisdictions and vice versa.
g) Federal policy prevails on any issue relating to the use of military reservation lands.
h) There will be an ongoing competition of land uses between the national interest and local preference.
i) The study will make recommendations that may differ from comprehensive plans, policies and regulations current at the time of study development.
j) The military and local governments are committed to solving problems where the problems and solutions have been identified.
k) The military and local governments are committed to avoiding problems by planning in a progressive fashion and in communicating with one another.

METHODOLOGY

The sequence of actions leading to this draft Study followed generally the proposed scope agreed to by the Office of Economic Adjustment and the participating jurisdictions. These elements are enumerated below:

1. An inventory of land use within the study area.
2. An assessment of the noise environment.
3. A land use impact analysis.
4. Noise abatement and alternatives and procedures development.
5. Abatement alternatives evaluation.
6. Identification of recommended procedures.
7. Study area compatibility recommendations.
8. Implementation strategies and roles and responsibilities.

The method used to develop the JLUS is a compilation of workshop and committee processes. Two committees were established at the outset, a Technical Review Committee (TRC) and a Citizen Review Committee (CRC). The following summary explains the participation levels of each group:

Technical Review Committee: From the outset, each participating jurisdiction and military installation committed staff time to support the Study. The role of these representatives was to provide technical expertise on the county, city or installation that they represented. Meeting approximately once per month, the Technical Committee determined study direction, environmental review, scope elements, precise land use conflicts, and formulated and agreed on draft recommendations. In addition, Committee members provided Pierce County staff with necessary information to produce a regional characterization. Committee
members were responsible for keeping their respective elected officials informed of JLUS progress.

Citizen Review Committee: The Citizen Review Committee represented a cross-section of regional interests and geography. Its primary responsibilities were to identify issues, review written documents, and take the lead role in facilitating public comment at community workshops. The Committee assisted in narrowing the scope elements, identifying specific land use conflicts, and providing alternative recommendations to resolve conflicts.

Pierce County Joint Land Use Team: As lead agency, Pierce County Department of Planning and Land Services provided staff to manage the JLUS grant, to organize the efforts of the Citizen and Technical Review Committees, to characterize scope elements within the study area, and to compose all written documentation and Study materials. The Joint Land Use Team operated out of the Current Planning Division of the Pierce County Department of Planning and Land Services. Efforts of this group were coordinated directly with personnel in the Comprehensive Planning Division, Department of Public Works (Transportation Division) and Executive Planning Office of County Operations.

Public Participation: Residents living adjacent to the military installations, businesses in the study area and Department of Defense personnel living and working on the military installations were identified as a valuable resource in providing a broad cross-section of perceived conflicts. A public participation exercise was created to solicit ideas from these groups.

Public workshops were held in Lacey, Yelm, Lakewood, Spanaway and Fort Lewis, beginning on March 25, 1991 and concluding on April 17, 1991. Responses were sought to the following three questions:

   a) How is your community affected by having the military as a neighbor?
   b) What are the benefits your community derives from the local military presence?
   c) How would you like things to be (in an ideal world, how would the military bases and surrounding communities relate to one another)?

Workshop notification took several forms. The Citizen and Technical Committees and Pierce County staff developed a brochure for mailing to all property owners within a half mile distance from either installation boundary or the 65 Ldn\(^3\) contour (aircraft noise) for McChord Air Force Base. A total of 12,748 brochures were sent. In addition to direct mail, press releases were issued to 35 local media contacts, encompassing radio television and print (both civilian and military). Announcements were distributed and posted by Citizen Review Committee members and local organizations and were posted in high visibility locations.

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3 For an explanation of measuring average day night sound levels, see Appendix G.
Chapter 1
What is the Joint Land Use Study?

The workshops were conducted as facilitated brainstorming sessions in small groups of six to eight people. With Citizen and Technical Committee members as facilitators, citizens provided responses to the three questions in a round robin fashion. All answers were documented and keyed to their geographic origin.

Total attendance at the workshop series amounted to 98 citizens. This total was augmented by 234 responses from the questionnaire that was part of the direct mail brochure.

At the conclusion of the public participation exercise, Pierce County staff grouped similar responses and wrote summary statements within each grouping. See Chapter 4 for details on how these summary statements were used in defining issues. Responses and summary statements are attached as Appendix D.

ENVIRONMENTAL REVIEW

As the participating jurisdictions formally adopt the Joint Land Use Study, an environmental review would be required as defined by Chapter 43.21C of the Revised Code of Washington (RCW). An expanded environmental checklist was prepared to analyze the effects of the JLUS. Because of the many jurisdictions, the varying possible methods of implementation and the varying degree of implementation likely, the Technical Review Committee advised that a Mitigated Determination of Nonsignificance (MDNS) should be issued. Mitigation consists of agreement between these entities that thorough environmental review will occur at the implementation stage (copies of checklist and MDNS are in Appendix C).

GROWTH MANAGEMENT ACT EFFECT ON JLUS

Comprehensive plan and land use regulation revisions required by the Growth Management Act provide a vehicle for implementing JLUS recommendations. During the 1990 and 1991 legislative sessions, the State of Washington passed two bills which collectively have been termed the Growth Management Act. The Act requires the adoption of comprehensive land use plans and development regulations by all counties with gross population of greater than 50,000 and at least a 10% growth rate in the last ten years. This requirement extends to municipalities located within those counties that meet the criteria. The deadline for completion of the comprehensive plan portion is July 1, 1993, with accompanying regulations adopted no later than one year following the comprehensive plan.

Both Pierce and Thurston Counties must plan. Consequently, each county and city jurisdiction participating in the JLUS is currently undergoing review and revision of comprehensive plans based on standards formulated by the Washington Department of Community Development. New plans based on Growth Management Act guidelines are expected to recommend changes in land use planning around the military installations. It will be the responsibility of the participating jurisdictions to ensure that JLUS recommendations are taken into account when developing their individual comprehensive plans.4

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4 For additional information on the Growth Management Act and its impact on the JLUS, see Chapter 4, Section G.
CHAPTER 2
STUDY AREA PROFILE

STUDY AREA BOUNDARIES

It may be argued that nearly all of Pierce and Thurston Counties, and portions of King County, are effected by some degree by their proximity to McChord, Fort Lewis and Camp Murray. However, in order to meet the JLUS goal of encouraging compatible development, the primary study area was narrowed to those areas likely to experience the greatest effect.

A line was drawn connecting points one-half mile outward from either the installation boundaries or the 65 Ldn noise contour line (See Figure 4.6). This one-half mile width strip constitutes the area of focus for civilian JLUS issue identification, data collection and recommendations.

PHYSICAL SETTING

McChord Air Force Base, Fort Lewis and Camp Murray occupy a large contiguous block in the southern Puget Sound Basin in the State of Washington. The bulk of this land is in Pierce County with a significant portion of Fort Lewis located in northern Thurston County. Specific acreage totals for the three installations are shown below.

<table>
<thead>
<tr>
<th>INSTALLATION</th>
<th>ACRES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Lewis</td>
<td>86,176</td>
</tr>
<tr>
<td>McChord Air Force Base</td>
<td>4,601</td>
</tr>
<tr>
<td>Camp Murray</td>
<td>228</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>91,005</strong></td>
</tr>
</tbody>
</table>

Surrounding the installations are a number of incorporated cities and towns and unincorporated communities (See Figure 2.1). The largest concentration of population is clustered in the northern one-third of the study area, encompassing the City of Tacoma, Town of Steilacoom and City of DuPont, and the unincorporated communities of Lakewood, Tillicum, Parkland and Spanaway. Several smaller towns flank the eastern border of Fort Lewis, including Roy, City of Yelm, and Rainier. The cities of Lacey and Olympia are located at the southernmost extent of Puget Sound, approximately six miles west of Fort Lewis. Between the Pierce and Thurston County portions of Fort Lewis along the Nisqually River is the Nisqually Indian Reservation.

On a southwest-northeast axis, the installations extend approximately 22 miles, bridging the Nisqually River northwest of Yelm. From its western border on Nisqually Reach in Puget Sound, Fort Lewis stretches over 15 miles to the southeast.
Chapter 2
Study Area Profile

The terrain ranges from a nearly level plain with isolated, well-rounded hills in Pierce County to hilly (generally less than 15 percent slope) in Thurston County. Steep bluffs fronting Puget Sound and along the Nisqually River are exceptions. Lack of significant topographic variation contributes to the region's overall suitability for military training exercises.

Most of the surface land features of the Joint Land Use Study area were formed during the recent glacial episodes. Large blocks of ice contained in the outwash deposits of the Vashon glacier melted to form large depressions, many of which are filled by groundwater lakes which are a key feature of the area.

Suitability of the soils for agriculture is limited generally to forage and trees. Most soils are excessively drained, gravelly sandy loams about two feet thick and represent unconsolidated to partially consolidated glacial deposits. The Nisqually Delta alluvial fan with associated river deposit soils spreads out just west of Fort Lewis before emptying into Puget Sound.

The Nisqually River is the primary hydrologic feature in the study area, and its watershed drains a large proportion of Fort Lewis. In the south Fort Lewis area in Thurston County, the Deschutes River watershed drains into Budd Inlet. Other major drainages include Muck Creek, Murray Creek, Clover Creek and Sequalitchew Creek. Several major freshwater bodies of water are located on or near the military installations including American Lake, Spanaway Lake, Gravelly Lake, Sequalitchew Lake, Lewis Lake, Nisqually Lake, Lake St. Clair, Patterson Lake and Offut Lake.

Strategically, the installations are ideally situated to meet current and future national defense objectives, particularly for strategic deployment. Five miles north of the northern tip of McChord AFB is the Port of Tacoma, a deep water, containerized seaport. Both rail and interstate connections link the port facilities with the military installations and points south. In addition, the Yakima Firing Center is located due east across the Cascade Range (three hours by state highway), which facilitates large scale training maneuvers in arid semi-desert conditions.

From a national perspective, the study area sits squarely in the middle of a region that consistently gains accolades for a high quality of life. In recognizing the Puget Sound Basin as a highly desirable location to live and work, national publications have cited the availability of many recreational, social and health amenities.

POPULATION

The population growth rates in Pierce County and Thurston County have been among the highest in the State of Washington for the past decade. Table 2.1 indicates the total 1991 civilian population by age. Although the growth rates have decreased, both counties are expected to experience continued population growth.

In 1991, Thurston County's population totaled 161,800. Between 1980 and 1990 Thurston County was the fifth fastest growing county in Washington with a 30.2 percent increase in
population. The average annual growth rate for Thurston County slowed to 2.7 percent from 1980 to 1990, compared to 4.9 percent from 1970 to 1980. In 1970, over one-half of the County's population resided in incorporated areas. Since 1970, development and population growth have shifted to unincorporated areas. In 1990, 64 percent of Thurston County's population resided in the unincorporated areas. From 1980 to 1990, the incorporated population grew 21 percent while unincorporated grew 37 percent.

### TABLE 2.1

CIVILIAN POPULATION BY AGE (1990)\(^5\)

<table>
<thead>
<tr>
<th>Counties &amp; Cities</th>
<th>0-17</th>
<th>18-24</th>
<th>25-64</th>
<th>65+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pierce Co.</td>
<td>159,649</td>
<td>66,599</td>
<td>298,469</td>
<td>61,486</td>
<td>586,203</td>
</tr>
<tr>
<td>Tacoma</td>
<td>46,010</td>
<td>19,679</td>
<td>86,717</td>
<td>24,258</td>
<td>176,664</td>
</tr>
<tr>
<td>Steilacoom</td>
<td>1,401</td>
<td>661</td>
<td>3,127</td>
<td>539</td>
<td>5,728</td>
</tr>
<tr>
<td>DuPont</td>
<td>170</td>
<td>68</td>
<td>290</td>
<td>64</td>
<td>592</td>
</tr>
<tr>
<td>Roy</td>
<td>85</td>
<td>16</td>
<td>129</td>
<td>28</td>
<td>258</td>
</tr>
<tr>
<td>Thurston Co.</td>
<td>43,392</td>
<td>13,517</td>
<td>85,861</td>
<td>18,468</td>
<td>161,238</td>
</tr>
<tr>
<td>Lacey</td>
<td>4,994</td>
<td>2,065</td>
<td>9,219</td>
<td>3,051</td>
<td>19,279</td>
</tr>
<tr>
<td>Yelm</td>
<td>490</td>
<td>118</td>
<td>608</td>
<td>121</td>
<td>1,337</td>
</tr>
<tr>
<td>Rainier</td>
<td>351</td>
<td>95</td>
<td>474</td>
<td>71</td>
<td>991</td>
</tr>
</tbody>
</table>

Sources: Washington State Office of Financial Management  
Thurston Regional Planning Council, The 1991 Profile

Pierce County's 1990 population totaled 586,203 making it the second most populated county in the state. Between 1980 and 1990, the County experienced a 18.3 percent increase in population which ranked it third in population gain in the state. The annual growth rate for the Pierce County has been consistent at 1.7 percent from 1970 to 1980 and from 1980 to 1990. Suburban and unincorporated areas are growing at a faster rate than the City of Tacoma. In 1970, Tacoma had almost 40 percent of the total county population in contrast to 30 percent today.

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\(^5\)Total county population includes incorporated population
TABLE 2.2
COUNTIES PRESENT AND PROJECTED GROWTH

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pierce County</td>
<td>485,643</td>
<td>524,900</td>
<td>586,203</td>
<td>613,192</td>
<td>656,085</td>
</tr>
<tr>
<td>Thurston County</td>
<td>124,264</td>
<td>139,500</td>
<td>161,800</td>
<td>178,946</td>
<td>197,563</td>
</tr>
</tbody>
</table>


STUDY AREA LAND USE

Historical Perspective: Development of the region has reflected shifting historical trends. Steilacoom and Fort Nisqually as frontier military and trading outposts between 1833 and mid 1860's. Later, local market centers, such as Parkland, Spanaway, Roy and Yelm, developed to support predominantly agricultural hinterlands.

The growing role of Tacoma as the region's dominant city in the late nineteenth century, coupled with rail links to Steilacoom and Spanaway, precipitated suburban growth in the Lakewood and South Tacoma areas. Somewhat independently, the establishment of an explosives manufacturing plant north of the Nisqually Delta prompted the development of the town of DuPont. Steady growth throughout the twentieth century has provided in-fill between many of these communities to the point where the historic market centers are now indistinguishable as distinct entities.

Surrounding Land Use: There is a wide range of land uses surrounding the more than 91,000 acres occupied by the military. This diversity can be characterized by a north to south trend from higher to lower-intensity land uses that corresponds to population density. Specific land use compatibility issues are discussed in Chapter 4.

The Northern Perimeter: In the areas north and northeast of the military lands (encompassing Steilacoom, Lakewood, South Tacoma, Parkland and Spanaway), the prevailing land use is single-family residential.

Several historic and recent commercial pockets and corridors serve this area, the most notable of these are Lakewood Colonial Center and Lakewood Mall, South Tacoma Way in Lakewood from Ponders northward, the Interstate 5 service corridor from South 84th Street to South 38th Street (including the Tacoma Mall) and Pacific Avenue from SR-512 south to the Roy Y.
Discourage residential development and other land uses that assemble concentrations of people in airport approach zones or in areas of highest noise around airports. (Facilities and Services II, Policy #22)

Preserve air facilities and services by promoting compatibility with surrounding land uses, coordinating ground transportation connections and by discouraging encroachment of incompatible development. (Facilities and Services II, Policy #23)

Pierce County - Parkland/Spanaway Comprehensive Plan: The Clear Zone lies within the Parkland/Spanaway Urban Environment. The environment is intended to accommodate high-density high-intensity land uses. The environment does, however, acknowledge the necessity of safety considerations under the McChord AFB runway threshold. The Urban Environments goal for development north of McChord AFB is as follows:

Light industrial activities which have convenient transportation access, low personnel per acre intensity and minimal environmental impacts upon surrounding areas should be encouraged immediately north of McChord Air Force Base.

Although the Urban Environment includes the following uses: light manufacturing and warehousing; commercial facilities; offices; community facilities, utilities and institutions; residential, including single-family, multifamily, mobile homes and mobile home parks; cultural, park and recreational, and wildlife habitat; land use applications such as rezones, conditional use permits and subdivisions, must meet the low-personnel, transportation, and low environmental impact test before being authorized.

Pierce County - Parkland/Spanaway Zoning: The policies of the Parkland/Spanaway Plan are implemented using pyramidal zone classifications. Pyramidal zoning allows all or part of the uses in other less intensive classifications as well as a list of new uses. For instance, the C-3 (Heavy Commercial) zone allows not only heavy commercial uses but also allows the majority of everything in the residential and less intensive commercial zones as well. So the number of uses increases in a pyramidal fashion with each successive zone. Manufacturing and industrial uses permit all commercial use but not residential uses. The following zone classifications lie within the McChord AFB Clear Zone:

1. RMH, Multi-Family Residence High-Density allows for maximum population density within the Parkland/Spanaway Plan. This classification is intended to provide higher density areas adjacent to community and commercial areas. Single-family minimum lot size is 7,200 square feet.

2. C-3, Heavy Commercial intended to provide for non-retail commercial and semi-industrial land uses. It also permits multi-family and single-family residences, mobile home parks, churches, public schools, retail business, offices, and recreational facilities. Single-family minimum lot size is 7,200 square feet.
3. M-1, Light Manufacturing intended to provide for low nuisance and low hazard industrial activities. It also permits commercial uses, churches, public schools, retail business, offices, and recreational facilities.

4. M-2, Heavy Manufacturing intended for higher intensity industrial activities and prohibits residential and institutional uses. The classification also permits commercial uses, churches, public schools, retail business, offices and recreational facilities.

ANALYSIS

The majority of the land uses and the majority of zoning within the Clear Zone is incompatible with AICUZ recommendations. Of particular concern are a mobile home park, single-family residences, and the professional office space. Even the light and heavy manufacturing uses are incompatible due to the potential for local concentrations of daytime workers.

Although Pierce County policy directs that land use in the Clear Zone be compatible, current zoning provides for an increasing number of incompatible land uses in the Clear Zone. Vacant parcels within the RMH zone permits multi-family development. Roughly 12 additional multi-family housing units could be constructed in the RMH area. The 14 acres of heavy commercial zoning has 720 square feet undeveloped. Since multifamily residences are permitted additional apartments or mobile homes could be constructed there as well. Approximately 18 acres of undeveloped property, zoned Light and Heavy Manufacturing, may allow incompatible uses such as professional offices, retail stores, recreation facilities and other businesses which may concentrate people. The likelihood of development increases as the supply of other property appropriately zoned and in close proximity to Interstate 5 and urban centers is diminished.

The majority of the developed land in the Clear Zone supports industrial activities, approximately seventeen acres. (See Table 4.5)

**TABLE 4.5**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undeveloped</td>
<td>20</td>
</tr>
<tr>
<td>Single Family Residential</td>
<td>5.5</td>
</tr>
<tr>
<td>Commercial</td>
<td>8</td>
</tr>
<tr>
<td>Industrial</td>
<td>17</td>
</tr>
</tbody>
</table>

Source: Pierce Planning and Land Services
The largest percentage, twenty-five percent (25%) of privately owned property in the Clear Zone is zoned Light Manufacturing (M-1). (See Table 4.6) The remaining property in the Clear Zone is Residential Multi-Family High-Density (RMH), Heavy Commercial (C3), Heavy Commercial Planned Development (C3-PDD), and Heavy Manufacturing (M-2).

<table>
<thead>
<tr>
<th>Zoning Classification</th>
<th>Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Multi-Family High-Density (RMH)</td>
<td>5</td>
</tr>
<tr>
<td>Heavy Commercial Planned Development District (C3-PDD)</td>
<td>1</td>
</tr>
<tr>
<td>Heavy Commercial (C3)</td>
<td>14</td>
</tr>
<tr>
<td>Light Manufacturing (M-1)</td>
<td>25</td>
</tr>
<tr>
<td>Heavy Manufacturing (M-2)</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Pierce County Planning and Land Services

**ALTERNATIVES**

a. Local governments adopt land use restrictions in Clear Zone.

b. Federal government (Department of Defense) purchase remaining private property in Clear Zone.

c. Authority to approve any development or redevelopment permits in Clear Zone is shared equally between Pierce County and the Air Force.

d. Pierce County allows no further development within the Clear Zone (requires purchase).

e. Pierce County purchases land for dedication as open space.

**RECOMMENDATIONS**

1. The Department of Defense should purchase in fee simple all property in the McChord AFB Clear Zone, supported actively by local government.

2. If fee simple purchase is not possible, the military should purchase the development rights in the Clear Zone.
3. Until acquisition of the Clear Zone occurs, Pierce County should restrict development and other land uses that assemble concentrations of people in the McChord AFB Clear Zone as follows:
   a. Prohibit new residential development.
   b. Encourage the relocation of existing residents to locations where land use is compatible with Joint Land Use Study recommendations.
   c. Permit industrial, manufacturing, and warehouse uses with fewer than an average of 25 people per hour/acre in a 24-hour period and noise reduction construction in public areas which meets the United States Department of Housing and Urban Development (HUD) standards.
   d. Allow low-intensity uses such as mining; cemeteries; agriculture, except livestock; open-space; and utilities.

4. Until acquisition of the Clear Zone occurs, Pierce County should prohibit the following land uses:
   a. Any use which involves release of airborne substances, such as steam, dust, and smoke which interfere with aircraft operations.
   b. Any use which emits light, direct or indirect (reflections), which interfere with pilot's vision.
   c. Any use which emits electrical currents which may interfere with communication systems or navigational equipment.
   d. Any use which attracts birds or waterfowl [i.e., sanitary landfills, feeding stations, and the growth of certain vegetation].
   e. Any use which would have structures within 10 feet of aircraft approach-departure and/or transitional surfaces.

5. For proposed new development in the Clear Zone, environmental checklists should be referred to the McChord AFB Commander for comment prior to a threshold determination.

6. Puget Power and other utilities should work to eliminate all above-ground transmission lines within the Clear Zone.

7. Pierce County should support open-space tax exemptions for qualified properties in the Clear Zone.

**Issue #2: Incompatible land uses in the Accident Potential Zones**

**DESCRIPTION**

The probability of aircraft accidents in Accident Potential Zones I and II (APZ I, APZ II) lead to the Department of Housing and Urban Development (HUD), the Environmental Protection Agency (EPA), and the United States Air Force (USAF) to endorse the compatible use guidelines within the McChord AFB Air Installation Compatibility Use Zone
Study (AICUZ). The guidelines recommend restricting certain types of land uses. Restricted uses include those which concentrate people in a living or working environment, involve operations with hazardous characteristics that are likely to interfere with the operation of an aircraft. The recommended restrictions are intended to protect people on the ground and the pilots flying the aircraft.

To limit public exposure to possible physical injury, people should not be concentrated where the incidence of aircraft accidents is high. While the number of aircraft accidents are not high, a single accident can be a catastrophe to a community. Allowing a concentration of people increases the number of residents who may be injured or killed in an aircraft accident. Nor should the crew of an aircraft be exposed to the additional risks when certain businesses are permitted under landing and departure tracks.

Currently Pierce County and the City of Tacoma allow uses which are identified by the compatibility use guidelines as incompatible in Accident Potential Zones I and II. Businesses which are labor intensive and other land uses which concentrate people are allowed to develop in APZ I and II. First, allowing certain businesses which pose a hazard to aircraft operations increase the possibility of an aircraft accident. These hazards include uses which 1) release any substance into the air which would impair visibility or interfere with the operation of an aircraft, 2) produce light emissions which would interfere with pilot vision, 3) produce electrical emissions which would interfere with aircraft communication systems or navigational equipment, 4) attract birds or water fowl.

**Accident Potential Zone I:** Seven and eight-tenths percent (7.8%) of all Air Force aircraft accidents have occurred in Accident Potential Zone I (APZ I). This 5,000 feet long by 3,000 feet wide rectangle extends from the northern edge of the Clear Zone (south of the Interstate 5 and State Route 512 interchange) north to South 93rd Street. It is located entirely in unincorporated Pierce County. Currently approximately 1,666 people reside within this zone.

**TABLE 4.7**

<table>
<thead>
<tr>
<th>1990 POPULATION - ACCIDENT POTENTIAL ZONE I</th>
</tr>
</thead>
<tbody>
<tr>
<td>APZ I (CUD 3)</td>
</tr>
<tr>
<td>APZ I (CUD 4)</td>
</tr>
<tr>
<td>Total Population APZ I</td>
</tr>
</tbody>
</table>

Source: 1990 Census

**Accident Potential Zone II:** Five percent (5.0%) of all Air Force aircraft accidents have occurred in Accident Potential Zone II (APZ II). This 8,000 feet long by 3,000 feet wide rectangle extends from the northern end of APZ I to South 72nd Street. Approximately 40% of this zone is located in the City of Tacoma with the remainder in Pierce County.

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Accident Potential Zone II (APZ II) can be characterized generally as a residential area, encompassing the northeastern corner of Lakewood in Pierce County and the Arlington neighborhood of Tacoma.

| TABLE 4.8  
1990 POPULATION - ACCIDENT POTENTIAL ZONE II |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>APZ II (CUD 9)</td>
<td>239</td>
</tr>
<tr>
<td>APZ II (CUD 10)</td>
<td>2,748</td>
</tr>
<tr>
<td>APZ II (CUD 11)</td>
<td>339</td>
</tr>
<tr>
<td>Total Population APZ II</td>
<td>3,326</td>
</tr>
</tbody>
</table>

Source: 1990 Census

CURRENT POLICIES AND REGULATIONS

Air Force - McChord AFB Air Installation Compatible Use Zone Study (AICUZ): The recommendations for land uses in Accident Potential Zone I (APZ I) and Accident Potential Zone II (APZ II) combine accident potential with noise effects and refer to Compatible Use Districts (CUDs). A guide to land uses considered compatible within the CUDs is reproduced in Table 4.2. Guidelines in the McChord AICUZ Study are recommendations to be considered along with local economic and community characteristics.

Several generalizations may be drawn about incompatible land uses in Accident Potential Zones.

1. All residential and transient lodging uses are considered incompatible in APZ I. Recommendations suggest limiting residential development to single-family residences with one dwelling unit per one acre in APZ II.

2. Commercial or industrial uses are incompatible in both APZ I and II which 1) stockpile combustible or explosive materials, 2) release substance into the air which impair visibility or interfere with the operation of an aircraft, 3) produce light emissions which interfere with pilot vision, 4) produce electrical emission which interfere with aircraft communication systems or navigation, or 5) attract birds or waterfowl which compound the risk of life.

3. Commercial, industrial, or public assembly uses which attract concentrations of people (such as restaurants, labor intensive manufacturing and auditoriums) increase the number of people placed at risk are incompatible in both APZ I and APZ II.

City of Tacoma - Comprehensive Plans: Neither the Generalized Land Use Plan nor the South Tacoma Plan for the City of Tacoma contain policies regarding land use compatibility.

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and aircraft accident potential in APZ II. The South Tacoma Plan provides for the continuation of developing single-family residential with multi-family residential and small office uses designated along South 72nd Street.

City of Tacoma - Zoning: The current zoning classifications in APZ II include One-Family Dwelling District (R2), Low-Density Multi-Family Dwelling District (R4L), and Commercial (C2). These classifications allow population densities which are incompatible with the McChord AICUZ Compatible Use Guidelines. The R2 classification permits a residential density of one unit per 5,000 square feet (8.7 units per acre). The R4L classification permits residential multi-family density of 6,000 square feet for the first four units, with an additional 1,500 square feet for each unit in excess of four (26 units per acre). The C2 classification permits a residential density of 6,000 feet per two-family or multi-family dwellings uses that concentrate people on site (12.5 units per acre).

Pierce County - Interim Growth Management Policies: The Pierce County Interim Growth Management Policies provide the following guidance within its "Facilities and Service II - Circulation Policies" relative to compatible use around airports:

- **Strictly observe Federal Aviation Administration (FAA) and military aviation Air Installation Compatible Use Zone (AICUZ) standards for development in airport areas, including height limitations, noise mitigation and land use considerations.** (Facilities and Services II, Policy #21)

- **Discourage residential development and other land uses that assemble concentrations of people in airport approach zones or in areas of highest noise around airports.** (Facilities and Services II, Policy #22)

- **Preserve air facilities and services by promoting compatibility with surrounding land uses, coordinating ground transportation connections and by discouraging encroachment of incompatible development.** (Facilities and Services II, Policy #23)

Pierce County - Parkland/Spanaway Comprehensive Plan: The Parkland/Spanaway Comprehensive Plan designates the area east of Interstate 5 in Accident Potential Zone I (APZ I) as an Urban Environment. The Urban Environment is intended to provide a high intensity land use area which allows the highest basic density and intensity of development. However, the Plan recognizes the presence of McChord's flight operations as follows:

- **Facilities which provide warehousing, light industry and other similar uses are encouraged to locate in the Urban Environment adjacent and north of McChord Air Force Base. The area's excellent access to major transportation links and present land use pattern warrants the continuation of the present uses. Currently, future residential development is limited by the negative environmental effects created by McChord Air Force Base. Life safety considerations under the runway threshold and the prohibition of FHA-VA housing financing require a low person per acre density in this area.** (Parkland-Spanaway Comprehensive Plan, Page 43)
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Pierce County - Parkland/Spanaway Zoning: The current zoning classifications in APZ I includes Residential Multi-Family (RM), Residential Multi-Family High-Density (RMH), Light Manufacturing (M1), and Heavy Manufacturing (M2). All of these zoning classifications allow uses which may concentrate people.

1. Manufacturing classification allows uses which manage material with hazardous characteristics.
2. Residential classifications permit densities which are inconsistent with the compatible use guidelines in the McChord AICUZ.
3. RM classification allows for multi-family residential development at a density 16 units per acre.
4. RMH classification allows for multi-family residential development at a density 19 units per acre.

Pierce County - Lakewood Community Plan: Proposed land uses for the portion of the Lakewood Community Plan in Accident Potential Zones I and II range from low- and high-density residential to commercial and industrial land uses. In delineating proposed uses in the plan, the primary determinant was to recognize existing land uses. Most of APZ I is proposed for commercial or industrial uses, with a band of low-density residential between South 93rd Street and South 96th Street. The area north of South 93rd Street to the Tacoma city limits (corresponding to APZ II) is slated for low- and high-density residential uses flanked by commercial to the west and industrial to the east.

Because of the concurrent development of the Lakewood Community Plan and the Joint Land Use Study, implementation of JLUS recommendations is advocated as follows:

**Pierce County should investigate the recommendations of the ICUZ and AICUZ studies for incorporation into the County's Comprehensive Land Use Plan.** (Natural and Cultural Resources Element - Natural Resources/Environment-Noise, Objective B, Policy 2)

**Future updates of the Lakewood Community Plan should incorporate any adopted county-wide policies that stem from the ICUZ and AICUZ reports and recommendations from the Joint Land Use Plan.** (Natural and Cultural Resources Element - Natural Resources/Environment-Noise, Objective B, Policy 3)

Specific regulations will not be developed to implement the Lakewood Community Plan. Instead of changing Lakewood zoning pending the update of the Pierce County Comprehensive Plan, interim zoning regulations have been adopted.

Pierce County - Lakewood Interim Zoning: Until July 1, 1994, or adoption of land use regulations to implement the Comprehensive Plan update, Lakewood area development is governed by Lakewood Interim Zoning (Ordinance # 90-1015S). The previous zoning classifications are combined into broader categories that collapse all single family residential zoning classifications into an Interim Single Family (ISF-10) zone, all multi-family zoning classifications into an Interim Multi-Family (IMF) zone, and all industrial, manufacturing and commercial zoning classifications into an Interim Business (IB) zone.
These residential classifications permit densities and the manufacturing classifications permit uses which are not consistent with the compatible use guidelines in the McChord AICUZ.

1. ISF-10 classification permits a single-family residential density of one unit per 10,000 square feet.

2. IMF classification permits a multi-family residential density requires 7,200 square feet for the first dwelling unit and 3,600 square feet per additional dwelling units.

3. IB classification allows manufacturing and commercial uses which may concentrate people and/or manage material which has hazardous characteristics.

ANALYSIS

When compared against the McChord Air Installation Compatible Use Zone Study (AICUZ) land use recommendations, a large proportion of APZ I and APZ II are occupied by incompatible land uses. The existing comprehensive plan policies and zoning regulations provide for an increase in the number of incompatible uses in years to come. With the exception of low-density single family residences in APZ II, the single family residences, multi-family residences, and businesses which attract concentration of citizen, are not appropriate for either Accident Potential Zone. Existing nonconforming uses might be allowed to continue, but zoning should preclude new or replacement development that is not consistent with AICUZ recommendations.

Existing Land Use - APZ I and APZ II: Acreage of existing land uses in APZ I is displayed in Table 4.9

<table>
<thead>
<tr>
<th>TABLE 4.9</th>
<th>EXISTING LAND USE IN ACRES - ACCIDENT POTENTIAL ZONE I</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAND USE TYPE</td>
<td>CUD 3</td>
</tr>
<tr>
<td>Single-Family Residential</td>
<td>25</td>
</tr>
<tr>
<td>Multi-Family Residential</td>
<td>10</td>
</tr>
<tr>
<td>Commercial</td>
<td>35</td>
</tr>
<tr>
<td>Industrial</td>
<td>35</td>
</tr>
<tr>
<td>Undeveloped</td>
<td>74</td>
</tr>
<tr>
<td>Mineral Extraction</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: Pierce County Planning and Land Services, 1991 Field Inventory

As a reflection of the zoning, the predominant land use in APZ II is residential. Single family residential uses account for approximately 246 acres. Table 4.10 shows the existing land use in APZ II.
### TABLE 4.10
EXISTING LAND USE IN ACRES - ACCIDENT POTENTIAL ZONE II

<table>
<thead>
<tr>
<th>LAND USE TYPE</th>
<th>CLUID 9</th>
<th>CLUID 10</th>
<th>CLUID 11</th>
<th>TOTAL</th>
<th>% of TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-Family Residential</td>
<td>45</td>
<td>181</td>
<td>20</td>
<td>246</td>
<td>51</td>
</tr>
<tr>
<td>Multi-Family Residential</td>
<td>5</td>
<td>55</td>
<td>0</td>
<td>60</td>
<td>12</td>
</tr>
<tr>
<td>Commercial</td>
<td>0</td>
<td>45</td>
<td>0</td>
<td>45</td>
<td>9</td>
</tr>
<tr>
<td>Vacant</td>
<td>0</td>
<td>62</td>
<td>15</td>
<td>77</td>
<td>16</td>
</tr>
<tr>
<td>Public</td>
<td>0</td>
<td>15</td>
<td>1</td>
<td>9</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: Pierce County Planning and Land Services, 1991 Field Inventory
City of Tacoma, 1990 Inventory

**Existing Zoning - APZ I:** A mixture of zoning classifications are present in APZ I. Land use classifications in this zone include single family residential, multi-family residential, commercial, and industrial classifications. The Parkland/Spanaway Zoning Regulations are developed as pyramidal zone classifications. Pyramidal zoning allows all or part of the uses in other less intensive classifications as well as a list of new uses in successive zones.

Approximately 194 acres of the property is zoned commercial or industrial. East of the freeway, in the Parkland/Spanaway Plan Area, approximately 139 acres are zoned Heavy and Light Manufacturing (M1, M2). West of the freeway, in the Lakewood Plan Area, approximately 70 acres are zoned Interim Business. Existing zoning in APZ I is displayed in Table 4.11.

### TABLE 4.11
ZONING CLASSIFICATION - ACCIDENT POTENTIAL ZONE I

<table>
<thead>
<tr>
<th>Zoning Classification</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interim Single Family-10 (ISF)</td>
<td>36.6</td>
</tr>
<tr>
<td>Interim Multi-Family (IMF)</td>
<td>53.5</td>
</tr>
<tr>
<td>Residential Multi-Family (RM)</td>
<td>8.7</td>
</tr>
<tr>
<td>Residential Multi-Family High-Density (RMH)</td>
<td>26.2</td>
</tr>
<tr>
<td>Interim Business (IB)</td>
<td>68.3</td>
</tr>
<tr>
<td>Light Manufacturing (M-1)</td>
<td>96.4</td>
</tr>
<tr>
<td>Heavy Manufacturing (M-2)</td>
<td>32.7</td>
</tr>
</tbody>
</table>

Source: Pierce County Planning and Land Services, 1991 Inventory

**Existing Zoning - APZ II:** The current zoning classifications in APZ II can be generally characterized as predominantly residential. Approximately 302 acres of this area is zoned single-family residential and 135 acres zoned multi-family residential. Table 4.12 lists the zones and associate acreage.
TABLE 4.12
ZONING CLASSIFICATION - ACCIDENT POTENTIAL ZONE II

<table>
<thead>
<tr>
<th>Zoning Classification</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interim Single Family (ISP-10)</td>
<td>150</td>
</tr>
<tr>
<td>Single Family (R2)</td>
<td>152</td>
</tr>
<tr>
<td>Interim Multi-Family (IMF)</td>
<td>120</td>
</tr>
<tr>
<td>Low-Density Multi-Family (R4L)</td>
<td>14</td>
</tr>
<tr>
<td>Interim Business (IB)</td>
<td>32</td>
</tr>
<tr>
<td>Neighbor Commercial (C1)</td>
<td>5</td>
</tr>
<tr>
<td>Community Commercial (C2)</td>
<td>9</td>
</tr>
</tbody>
</table>

Source: Pierce County Planning and Land Services, 1991 Inventory

**Development Potential:** Potential housing units for the residually zoned vacant property within APZ I and APZ II are identified in Table 4.13 and Table 4.14. The number of potential housing units were estimated by dividing the total acreage for each zone by the minimum lot area for the type of residential use in the specific zones.

---

TABLE 4.13
APZ I - RESIDENTIAL DEVELOPMENT POTENTIAL ON VACANT LANDS²

<table>
<thead>
<tr>
<th>Pierce County</th>
<th>Total Acres in APZ I</th>
<th>Vacant Acres in APZ I</th>
<th>Residential Capacity in APZ I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interim Single Family</td>
<td>40</td>
<td>1.6</td>
<td>6 homes</td>
</tr>
<tr>
<td>Single Family (Parkland/Spanaway)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Interim Multi-Family</td>
<td>25</td>
<td>7.0</td>
<td>81 one bedroom units</td>
</tr>
<tr>
<td>Multi-Family (Parkland/Spanaway)</td>
<td>54</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Pierce County Planning and Land Services, 1991 Field Inventory

²The acreage used for these calculations are estimates.
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**TABLE 4.14**  
**APZ II - RESIDENTIAL DEVELOPMENT POTENTIAL ON VACANT LANDS**

<table>
<thead>
<tr>
<th></th>
<th>Total Acres in APZ II</th>
<th>Vacant Acres in APZ II</th>
<th>Residential Capacity in APZ II</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>City of Tacoma</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single-Family</td>
<td>185</td>
<td>28.2</td>
<td>245 homes</td>
</tr>
<tr>
<td>Multi-Family</td>
<td>13</td>
<td>10.5</td>
<td>301 one bedroom units</td>
</tr>
<tr>
<td><strong>Pierce County</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interim Single Family</td>
<td>168</td>
<td>4.0</td>
<td>17 homes</td>
</tr>
<tr>
<td>Single Family</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Interim Multi-Family</td>
<td>85</td>
<td>4.7</td>
<td>55 one bedroom units</td>
</tr>
</tbody>
</table>

Source: Pierce County Planning and Land Services, 1991 Field Inventory

The estimated acreage of vacant property zoned non-residential within APZ I and APZ II is shown is Table 4.15. Pierce County and the City of Tacoma do not establish minimum lot areas for commercial or manufacturing uses. As a result it is not possible to calculate the potential number of manufacturing or industrial uses in the two zones. However, the potential acreage which could be developed into commercial and manufacturing uses has been estimated. A multiplier of .85 is used, corresponding to the average percentage of buildable property after right-of-ways have been dedicated.

**TABLE 4.15**  
**NON-RESIDENTIAL ZONED VACANT LANDS**

<table>
<thead>
<tr>
<th></th>
<th>Total Acres in APZ I</th>
<th>Vacant Acres in APZ I</th>
<th>Total Acres in APZ II</th>
<th>Vacant Acres in APZ II</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>South Tacoma</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light Commercial (CI)</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>.7</td>
</tr>
<tr>
<td><strong>Lakewood</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interim Business (IB)</td>
<td>87</td>
<td>18</td>
<td>27</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>Parkland/Spanaway</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light Manufacturing (M1)</td>
<td>55</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Heavy Manufacturing (M2)</td>
<td>36</td>
<td>27</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Pierce County Planning and Land Services, 1991 Field Inventory  
City of Tacoma, 1990 Inventory

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3. The acreage used for these calculations are estimates.

4. The acreage used in these calculations are estimates.
The Air Force supports the development of APZ I and APZ II with compatible commercial and industrial uses. Compatible uses include operations which are not labor intensive, produce light or smoke, and/or store hazardous materials. An example of a compatible development is warehouses for nonexplosive materials.

Business groups, including the Pierce County/Tacoma Chamber of Commerce, have shown support for the Joint Land Use Study. Continuing support and involvement by the business community during its adoption and implementation process will enhance the success of the study. While the most effective method to reduce or prevent more incompatible use is through land use regulations, other avenues are also available. Industrial atlases can indicate that property lies in an Accident Potential Zone and identify preferred compatible land uses consistent with the Joint Land Use Study recommendations. Chambers of Commerce can provide information on compatible land uses in the Accident Potential Zones to people inquiring about suitable locations for new businesses. Real estate agents can identify properties in the Accident Potential Zones in multiple listings and provide clients with information materials on what the Accident Potential Zones mean.

ALTERNATIVES

a. Reach full agreement on future land uses in the Accident Potential Zones that balances public safety with economic need.

b. Prohibit additional incompatible land uses to develop in these zones.

c. Rezone APZ I and APZ II to promote non-residential uses and encourage compatible uses.

d. Limit new residential construction to single-family on minimum one acre lots.

e. Require real estate agents, mortgage lenders, and rental agents to inform clients of accident potential and have clients sign statements acknowledging that this information has been relayed.

f. Encourage military to take lead in redevelopment of APZs.

g. Encourage business community to lead the way on a voluntary program to remove land use conflicts.

h. Establish lines of communication between military and civilian leaders in overcoming land use incompatibilities.

i. Maintain a hazard zone overlay whereby development or redevelopment is required to be more compatible with AICUZ recommendations.

j. Do not take steps to address the issue.
RECOMMENDATIONS

1. Pierce County should develop regulations that minimize incompatible uses in Accident Potential Zone I as follows:
   a. Prohibit any new residential development.
   b. Prohibit any new use which involves release of airborne substances, such as steam, dust, and smoke which interfere with aircraft operations.
   c. Prohibit any new use which emits light, direct or indirect (reflections), which interfere with pilot's vision.
   d. Prohibit any new use which emits electrical currents which may interfere with communication systems or navigational equipment.
   e. Prohibit any new use which attracts birds or waterfowl [i.e., sanitary landfills, feeding stations, and the growth of certain vegetation].
   f. Prohibit any new use which results in a concentration of people, more than an average of twenty-five (25) people per hour/per acre in a 24-hour period.

2. Pierce County and the City of Tacoma should coordinate land use regulations developed to minimize land use incompatibilities in Accident Potential Zone II (APZ II) as follows:
   a. Prohibit any new use which involves release of airborne substances, such as steam, dust, and smoke which interfere with aircraft operations.
   b. Prohibit any new use which emits light, direct or indirect (reflections), which interfere with pilots vision.
   c. Prohibit any new use which emits electrical currents which may interfere with communication systems or navigational equipment.
   d. Prohibit any new use which attracts birds or waterfowl [i.e., sanitary landfills, feeding stations, and the growth of certain vegetation].
   e. Prohibit any new use which results in a concentration of people, more than an average of twenty-five (25) people per hour/per acre in a 24-hour period.
   f. Prohibit any new development or redevelopment which results in an increase in density or intensity of current development.

3. For development proposals in Accident Potential Zones I & II, environmental checklists should be referred to the McChord AFB Commander for comment prior to a threshold determination.

4. New churches, schools, libraries, and other similar buildings that concentrate people should not be located in Accident Potential Zones I or II.

5. Pierce County and the City of Tacoma should adopt Aircraft Accident Potential Areas as identified in the McChord AFB Air Installation Compatible Use Zone Study (AICUZ).
6. Upon adoption of accident potential zones, landlords, housing referral agencies, real estate agents, sellers, and lenders should include disclosure statements in rental agreements and purchase agreements.

7. Local governments should encourage the business community to lead the way on a voluntary program to remove land use conflicts in the Accident Potential Zones.

8. The military installations should update the Fort Lewis Installation Compatible Use Zone Study (ICUZ) and the McChord AFB Air Installation Compatible Use Zone Study (AICUZ) as missions change or land use compatibility standards change, but not less than every three (3) years in order to allow local jurisdictions to implement the Joint Land Use Study recommendations.
SECTION C - AIRCRAFT NOISE

Most complaints concerning airports relate to noise generated during normal aircraft operations. Aircraft noise can influence human behavior and activities in many ways and affect psychological and physiological health. While generalizations may be formulated about reactions to prolonged noise exposure, individual's tolerance to noise vary widely.

In an effort to minimize complaints from people affected by aircraft operations and address health and welfare concerns, civilian and military airport planners have developed land use compatibility guidelines based on levels of noise exposure. These are intended to assist land use regulatory agencies in zoning and planning issues. The Air Force Air Installation Compatible Use Zone (AICUZ) and the Army Installation Compatible Use Zone (ICUZ) studies were developed to provide such guidelines for McChord AFB and Gray Army Airfield, Fort Lewis respectively. Contained in these documents are land use compatibility recommendations for the jurisdictions participating in the JLUS.

Aircraft noise does not exist in a vacuum. Even if aircraft overflights were eliminated from an area, residents would still be affected by noise from other sources. This might involve truck and automobile traffic, diesel engines and rail cars on local railways, or noise associated with urban land uses, such as industry and lawn mowers. The area of concern at the north end of McChord Field is affected by non-aircraft noise sources. It is beyond the scope of the JLUS to address cumulative noise impacts of ambient (background) and aircraft noise except to note that the noise levels of a single event is not increased by the amount of background noise.

This section focuses on aircraft noise and its effects on civilian communities and includes a brief overview of aircraft noise and how it is measured and what techniques have been used to minimize the effects of noise on people. Recommendations are intended to achieve compatible development and redevelopment of areas affected by severe aircraft noise in the least restrictive manner possible.

MEASURING NOISE

Land use planning around airports is linked to the generation of noise contours using the Day-Night Average Sound Level (Ldn) system. The Ldn approach describes the total noise environment rather than measuring the decibel levels of individual noise events. This is a national uniform standard adopted by the Environmental Protection Agency (EPA), Department of Housing and Urban Development (HUD), the Federal Aviation Administration (FAA) and the Department of Defense (DOD).

Computation of Ldn begins with a single-event energy descriptor and adds corrections for the number of events and the time of day. Since the primary noise impact relates to residential areas, nighttime events are considered more annoying than daytime events and are weighted 10 decibels accordingly. Ldn values are calculated from a logarithmic average of single-event noise levels combined with flight tracks, fleet mix, and times of flights.

Joint Land Use Study noise contours represent the cumulative effect of all baseline aircraft activities. Contours are drawn around airfields to demarcate areas experiencing noise levels
supported and may be financed with federal funds. Only a small portion of the McChord’s 65 dBi noise contour is located in Tacoma and is shown on the accompanying map.

New residential development should be constructed using noise reduction measures to reduce noise levels within the structures to an acceptable level. Care should be exercised in locating land uses, particularly residential developments and other noise sensitive uses such as schools, nursing homes and churches, in high noise areas.

Policies

ST-8.1 Buffer Noise Sources
Encourage the use of buffer areas and/or noise absorbing barriers between sources of noise and residential areas or other noise sensitive land uses.

ST-8.2 Noise Reduction Measures
Promote the use of construction techniques, building siting and other means that reduce the level of internal and external noise, particularly in high noise areas.

ST-8.3 Noise Impacted Areas
Discourage development in noise impacted areas that will significantly increase noise levels by either a direct contribution or by removing an existing natural feature that acts as a noise absorbing barrier.

ST-8.4 Noise Sensitive Land Uses
Discourage the development of noise sensitive land uses within or near high noise areas.

Goal ST-8 Accident Potential Zone II

Lower residential densities and identify flight hazards in the APZ II zone to limit injury and property damage in the event of an Air Force accident.

Policy Intent

The Air Force and Army, together with local planning authorities, issued the Joint Land Use Study (JLUS) to address land use issues of mutual concern. In the study, the Air Force designated Accident Potential Zones (APZ) for the McChord Air Force Base which are areas where an aircraft mishap is most likely to occur if one were to occur. They do not reflect the probability of an accident. Accident Potential Zones are designed to follow arrival, departure and pattern flight tracks and are based upon analysis of historical accident data. Three zones are established: the Clear Zone, APZ I, and APZ II. A portion of McChord’s APZ II is located in Tacoma and is nearly three miles from the end of the runway.

Within the City of Tacoma, the APZ II encompasses an area bounded roughly on the north by a line north of the parallel to South 72nd Street, on the east by Fife Street, on the south by the southern corporate limits, and on the west by a line just east of South Tacoma Way and is depicted on the following map.

The Growth Management Act was amended in 2004 recognizing the vital component that military installations have to the State’s economy and the need to protect land surrounding military bases from development that is incompatible with the mission and operations of the installation. The McChord Air Force Base provides an invaluable contribution to the economy of the county and city. In addition to its role in protecting the security of our country, the Base benefits the City through the direct and indirect economic contributions of personnel and the purchase of goods and services. In recognition of its proximity and significance to the city, it is important to collaborate with McChord Air Force Base on land use plans and development that might affect the Base’s ability to conduct its mission.

Ensuring lower densities in the APZ II can help limit injury and property damage in the event of an Air Force accident. Other land use regulations can help keep Air Force-identified flight hazards out of the APZ II. While virtually all development in Tacoma took place prior to the JLUS and preceding studies, any future development within the APZ II should follow Air Force guidelines as detailed in the policies below.

Adopted 11/16/04, Ordinance No. 27295  (Last amended: 12/9/08, Amended Ord. #27769)  Neigh-50
Policies

**ST-9.1 Military Collaboration**
Establish procedures to provide timely notice to the commander of McChord Air Force Base concerning proposed amendments to the Comprehensive Plan and/or development regulations affecting lands adjacent to the military installation.

**ST-9.2 Limit Density**
Housing densities greater than six units per acre or any concentrations of more than 25 people per hour/per acre in any given 24-hour period are discouraged in the Accident Potential Zone II (APZ II).

**ST-9.3 Restrict Flight Hazards**
The following characteristics are also discouraged in Accident Potential Zone II (APZ II) development:
- a. Release of airborne substances such as steam, dust and smoke, which interfere with aircraft operations.
- b. Emission of light, either direct or indirect, which interferes with pilots’ vision.
- c. Emission of electrical currents, which interfere with communication systems or navigational equipment.
- d. Attraction to birds (i.e. landfills, feeding stations, etc.).
- e. Increased intensity or density in new development or redevelopment.

**ST-9.4 Minimize Incompatible Uses**
Discourage the following incompatible land uses within the Accidental Potential Zone II:
- a. Manufacturing involving chemicals, rubber, plastic, allied products, or scientific or calibrated products.
- b. Educational uses.
- c. Cultural facilities including churches.
- d. Public assembly uses including outdoor music amphitheaters.
Policies

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Establish procedures to provide timely notice to the commander of McChord Air Force Base concerning proposed amendments to the Comprehensive Plan and/or development regulations affecting lands adjacent to the military installation.

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- Attraction to birds (i.e. landfills, feeding stations, etc.).
- Increased intensity or density in new development or redevelopment.

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Discourage the following incompatible land uses within the Accident Potential Zone II:
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- Educational uses.
- Cultural facilities including churches.
- Public assembly uses including outdoor music amphitheaters.
Statistical Summary of Commercial Jet Airplane Accidents
Worldwide Operations | 1959–2015
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Introduction

The accident statistics presented in this summary are confined to worldwide commercial jet airplanes that are heavier than 60,000 pounds maximum gross weight. Within that set of airplanes, there are two groups excluded:

1) Airplanes manufactured in the Commonwealth of Independent States (CIS) or the former Union of Soviet Socialist Republics (USSR) are excluded because of the lack of operational data.
2) Commercial airplanes operated in military service. (However, if a military-owned commercial jet transport is used for civilian commercial service, those data will be included in this summary.)

The following airplanes are included in the statistics:

| Boeing 707/720 | Boeing 717 | A300 | BAe146 | F-28 | Concorde | L-1011 | BAC 1-11 | Comet 4
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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>707/720</td>
<td>717</td>
<td>A300</td>
<td>BAe146</td>
<td>F-28</td>
<td>Concorde</td>
<td>L-1011</td>
<td>BAC 1-11</td>
<td>Comet 4</td>
</tr>
<tr>
<td>727</td>
<td>DC-8</td>
<td>A300-600</td>
<td>Avro RJ-70/85/-100</td>
<td>F-70</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>737</td>
<td>DC-9</td>
<td>A310</td>
<td>CRJ-700/-900/-1000</td>
<td>F-100</td>
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<td>A330</td>
<td>EMB-190/-195</td>
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<tr>
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<td>MD-80/-90</td>
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<td>787</td>
<td></td>
<td>A380</td>
<td></td>
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</tbody>
</table>

Flight operations data for Boeing airplanes are developed internally from airline operator reports. Flight operations data for non-Boeing airplanes are compiled from www.ascendworldwide.com by Ascend. The source of jet airplane inventory data is Jet Information Services, Inc.

Accident data are obtained, when available, from government accident reports. Otherwise, information is from operators, manufacturers, various government and private information services, and press accounts.

Readers may note that cumulative accident totals from year to year may not exactly correlate with the expected change from the previous year's accidents. This is a result of periodic audits of the entire accident history for updates to the data.

Definitions related to development of statistics in this summary are primarily based on corresponding International Civil Aviation Organization (ICAO), U.S. National Transportation Safety Board (NTSB), and Flight Safety Foundation (FSF) terms, as explained in the next section.
Definitions

Airplane Accident
An occurrence associated with the operation of an airplane that takes place between the time any person boards the airplane with the intention of flight and such time as all such persons have disembarked, in which

- The airplane sustains substantial damage.
- The airplane is missing or is completely inaccessible.
  - An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.
- Death or serious injury results from
  - Being in the airplane.
  - Direct contact with the airplane or anything attached thereto.
  - Direct exposure to jet blast.

Excluded Events

- Fatal and nonfatal injuries from natural causes.
- Fatal and nonfatal self-inflicted injuries or injuries inflicted by other persons.
- Fatal and nonfatal injuries of stowaways hiding outside the areas normally available to the passengers and crew.
- Nonfatal injuries resulting from atmospheric turbulence, normal maneuvering, loose objects, boarding, disembarking, evacuation, and maintenance and servicing.
- Nonfatal injuries to persons not aboard the airplane.

The following occurrences are not considered airplane accidents: those that are the result of experimental test flights or the result of a hostile action, including sabotage, hijacking, terrorism, and military action.

Note: This is generally consistent with the ICAO and the NTSB definition of an accident (see the Referenced ICAO and NTSB Definitions section). The differences are:

1) The ICAO and NTSB references to “aircraft” were changed to “airplane” and references to propellers and rotors were eliminated.

2) This publication excludes events that result in nonfatal injuries from atmospheric turbulence, normal maneuvering, etc.; nonfatal injuries to persons not aboard the airplane; and any events that result from an experimental test flight or from hostile action, such as sabotage, hijacking, terrorism, and military action.

Note: Within this publication, the term “accident” is used interchangeably with “airplane accident.”
Definitions

Destroyed
The estimated or likely cost of repairs would have exceeded 50 percent of the new value of the airplane had it still been in production at the time of the accident.

Note: This definition is consistent with the FSF definition. NTSB defines “destroyed” as damaged due to impact, fire, or in-flight failures to an extent not economically repairable.

Fatal Injury
Any injury that results in death within 30 days of the accident.

Note 1: This is consistent with both the ICAO and the NTSB definitions.
Note 2: External fatalities include on-ground fatalities as well as fatalities on other aircraft involved.

Major Accident
An accident in which any of three conditions is met:
- The airplane was destroyed.
- There were multiple fatalities.
- There was one fatality and the airplane was substantially damaged.

Note: This definition is consistent with the NTSB definition. It also is generally consistent with FSF, except that the FSF definition specifies that fatalities include only occupants of the airplane. ICAO does not normally define the term “major accident.”

Serious Injury
An injury that is sustained by a person in an accident and that
- Requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received.
- Results in a fracture of any bone (except simple fractures of fingers, toes, or nose).
- Causes severe hemorrhage, nerve, muscle, or tendon damage.
- Involves injury to any internal organ.
- Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.
- Involves verified exposure to infectious substances or injurious radiation.

Note: This is generally consistent with the ICAO definition. It is also consistent with the NTSB definition except for the last bullet item, which is not included in the NTSB definition.
Definitions

Substantial Damage

Damage or failure that adversely affects the structural strength, performance, or flight characteristics of the airplane, and that would normally require major repair or replacement of the affected component.

Substantial damage is not considered to be

- Engine failure or damage limited to an engine, if only one engine fails or is damaged.
- Bent fairings or cowlings.
- Dents in the skin.
- Small puncture holes in the skin.
- Damage to wheels.
- Damage to tires.
- Damage to flaps.
- Damage to engine accessories.
- Damage to brakes.
- Damage to wingtips.

Note 1: This definition is generally consistent with the NTSB definition of substantial damage except it (1) deletes reference to “small puncture holes in the fabric” and “ground damage to rotor or propeller blades,” and (2) deletes “damage to landing gear” from the list of items not considered to be substantial damage.

Note 2: ICAO does not define the term “substantial damage.” Still, the above definition is generally consistent with the ICAO definition of damage or structural failure contained within part (B) of the ICAO accident definition.

Note 3: Boeing does not consider damage to be substantial if repairs to an airplane enable it to be flown to a repair base within 48 hours of the event.
Boeing Terms

The terms on this page were created by Boeing for this publication and do not have corresponding equivalents in ICAO or NTSB.

Accident Rates

In general, this expression is a measure of accidents per million departures. Departures (or flight cycles) are used as the basis for calculating rates because there is a stronger statistical correlation between accidents and departures than there is between accidents and flight hours, or between accidents and the number of airplanes in service, or between accidents and passenger miles or freight miles. Airplane departures data are continually updated and revised as new information and estimating processes become available. These form the baseline for the measure of accident rates and, as a consequence, rates may vary between editions of this publication.

Airplane Collisions

Events involving two or more airplanes are counted as separate events, one for each airplane. For example, destruction of two airplanes in a collision is considered to be two separate accidents.

Fatal Accident

An accident that results in fatal injury.

Hull Loss

Airplane totally destroyed or damaged and not repaired. Hull loss also includes, but is not limited to, events in which
- The airplane is missing.
  - An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.
- The airplane is completely inaccessible.
Exclusions

Certain airplanes and events are excluded from consideration as accidents in this summary. This is a complete list of those exclusions.

Excluded Airplanes
Airplanes manufactured in the Commonwealth of Independent States (CIS) or the former Union of Soviet Socialist Republics (USSR) are excluded because of the lack of operational data. Commercial airplanes operated in military service are also excluded. (However, if a military-owned commercial jet transport is used for civilian commercial service, those data are included in this summary.)

Excluded Events
- Fatal and nonfatal injuries from natural causes.
- Fatal and nonfatal self-inflicted injuries or injuries inflicted by other persons.
- Fatal and nonfatal injuries of stowaways hiding outside the areas normally available to the passengers and crew.
- Nonfatal injuries resulting from atmospheric turbulence, normal maneuvering, loose objects, boarding, disembarking, evacuation, and maintenance and servicing.
- Nonfatal injuries to persons not aboard the airplane.
- Experimental test flights (however, maintenance test flights, ferry, positioning, training, and demonstration flights are not excluded).
- Sabotage, hijacking, terrorism, and military action.
Referenced ICAO and NTSB Definitions

International Civil Aviation Organization (ICAO) and National Transportation Safety Board (NTSB) definitions are included below for reference.

**Accident**

ICAO defines an “accident” as follows:

*Accident.* An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

A) A person is fatally or seriously injured as a result of:
   - Being in the aircraft, or
   - Direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
   - Direct exposure to jet blast,
     except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew, or

B) The aircraft sustains damage or structural failure which:
   - Adversely affects the structural strength, performance, or flight characteristics of the aircraft, and
   - Would normally require major repair or replacement of the affected component,
     except for engine failure or damage, when the damage is limited to a single engine (including its cowlings or accessories), to propellers, wingtips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome).

C) The aircraft is missing or is completely inaccessible.

NTSB defines an “aircraft accident” as follows:

*Aircraft accident* means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. For purposes of this part, the definition of “aircraft accident” includes “unmanned aircraft accident,” as defined in 49 CFR 830.2.
Referenced ICAO and NTSB Definitions

Serious Injury

ICAO defines “serious injury” as follows:

*Serious Injury.* An injury that is sustained by a person in an accident and which:

A) Requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or

B) Results in a fracture of any bone (except simple fractures of fingers, toes or nose); or

C) Involves lacerations that cause severe hemorrhage, nerve, muscle, or tendon damage; or

D) Involves injury to any internal organ; or

E) Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface; or

F) Involves verified exposure to infectious substances or injurious radiation.

NTSB defines “serious injury” as follows:

*Serious injury* means any injury that

1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received;

2) Results in a fracture of any bone (except simple fractures of fingers, toes, or nose);

3) Causes severe hemorrhages, nerve, muscle, or tendon damage;

4) Involves any internal organ; or

5) Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.

Substantial Damage

NTSB defines “substantial damage” as follows:

*Substantial damage* means damage or failure that adversely affects the structural strength, performance, or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component. Engine failure or damage limited to an engine if only one engine fails or is damaged, bent fairings or cowling, dented skin, small puncture holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered “substantial damage” for the purpose of this part.

ICAO does not define the term “substantial damage.”
## 2015 Airplane Accidents

### All Accidents | Worldwide Commercial Jet Fleet

<table>
<thead>
<tr>
<th>Event Date</th>
<th>Airline</th>
<th>Model Age in Years</th>
<th>Type of Operation</th>
<th>Accident Location</th>
<th>Phase of Flight</th>
<th>Event Description</th>
<th>Damage Category</th>
<th>Hull Loss</th>
<th>Injury Category</th>
<th>Onboard Fatalities/ Occupants (External Fatalities)</th>
<th>Major Accident</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-Jan-15</td>
<td>Ethiopian Airlines</td>
<td>737-400 (18)</td>
<td>Sched Pax</td>
<td>Accra, Ghana</td>
<td>Landing</td>
<td>The airplane sustained damage during a hard landing. The airplane subsequently veered off the side of the runway where the landing gear and No. 2 engine separated. There were no injuries.</td>
<td>Destroyed</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>9-Feb-15</td>
<td>US Airways</td>
<td>ERJ 190 (7)</td>
<td>Sched Pax</td>
<td>Houston, USA</td>
<td>Landing</td>
<td>The airplane sustained damage when it landed without the nose landing gear extended. There were minor injuries sustained during the evacuation.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-Feb-15</td>
<td>Cargojet Airways Ltd.</td>
<td>757-200 (28)</td>
<td>Sched Cargo</td>
<td>St. Johns, Canada</td>
<td>Taxi</td>
<td>The airplane sustained damage while taxiing on an ice-covered ramp when directional control was lost and the airplane slid into a building. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-Mar-15</td>
<td>Turkish Airlines</td>
<td>A330 (1)</td>
<td>Sched Pax</td>
<td>Kathmandu, Nepal</td>
<td>Landing</td>
<td>While landing in low-visibility conditions, the airplane performed a go-around. Damage was sustained during the second landing attempt when the airplane veered off the runway and the nose gear collapsed. There were minor injuries sustained during the evacuation.</td>
<td>Destroyed</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>5-Mar-15</td>
<td>Delta Air Lines</td>
<td>MD-88 (27)</td>
<td>Sched Pax</td>
<td>New York, USA</td>
<td>Landing</td>
<td>The airplane sustained damage while landing on an icy runway when it veered off the side of the runway and impacted an embankment. There were minor injuries sustained during the evacuation.</td>
<td>Substantial</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29-Mar-15</td>
<td>Air Canada</td>
<td>A320 (23)</td>
<td>Sched Pax</td>
<td>Halifax, Canada</td>
<td>Final Approach</td>
<td>The airplane sustained damage during final approach when it impacted power lines and terrain prior to the runway. There were minor injuries sustained during evacuation.</td>
<td>Destroyed</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>13-Apr-15</td>
<td>Jet Airways</td>
<td>737-800 (12)</td>
<td>Sched Pax</td>
<td>Khaipur, India</td>
<td>Landing</td>
<td>The airplane sustained damage during landing when the left main landing gear collapsed. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-Apr-15</td>
<td>Asiana Airlines</td>
<td>A320 (8)</td>
<td>Sched Pax</td>
<td>Hiroshima, Japan</td>
<td>Landing</td>
<td>The airplane touched down short of the runway threshold after impacting airport infrastructure, subsequently reaching the runway, then veering off side onto soft ground. There were minor injuries sustained during the evacuation.</td>
<td>Destroyed</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>25-Apr-15</td>
<td>Turkish Airlines</td>
<td>A320 (8)</td>
<td>Sched Pax</td>
<td>Istanbul, Turkey</td>
<td>Landing</td>
<td>The airplane sustained damage when its engine and wing contacted the runway, followed by a hard touchdown. The crew performed a go-around. During the second landing attempt, the landing gear collapsed and the airplane veered off the runway. There were no injuries.</td>
<td>Destroyed</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>25-May-15</td>
<td>Aeroflot</td>
<td>737-800 (0)</td>
<td>Sched Pax</td>
<td>Moscow, Russia</td>
<td>Landing</td>
<td>The airplane sustained damage due to a tail strike during landing. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10 | 2015 STATISTICAL SUMMARY, JULY 2016

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## 2015 Airplane Accidents

### All Accidents | Worldwide Commercial Jet Fleet

<table>
<thead>
<tr>
<th>Event Date</th>
<th>Airline</th>
<th>Model (Age in Years)</th>
<th>Type of Operation</th>
<th>Accident Location</th>
<th>Phase of Flight</th>
<th>Event Description</th>
<th>Damage Category</th>
<th>Hull Loss</th>
<th>Injury Category</th>
<th>Onboard Fatalities/ Occupants (External Fatalities)</th>
<th>Major Accident</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Aug-15</td>
<td>American Airlines</td>
<td>A321 (3)</td>
<td>Sched Pax</td>
<td>Charlotte, USA</td>
<td>Final Approach</td>
<td>During approach, the airplane sustained damage when it impacted runway approach lights, followed by a subsequent tail strike. The crew performed a go-around and landed successfully. There were no injuries.</td>
<td>Substantial</td>
<td>None</td>
<td>Serious</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22-Aug-15</td>
<td>Garuda Indonesia</td>
<td>A330 (3)</td>
<td>Sched Pax</td>
<td>Jakarta, Indonesia</td>
<td>Cruise</td>
<td>While enroute, a flight attendant was injured by a failed wine chiller.</td>
<td>None</td>
<td>None</td>
<td>Serious</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28-Aug-15</td>
<td>Cardig Air</td>
<td>737-300 (29)</td>
<td>Sched Cargo</td>
<td>Wamena, Indonesia</td>
<td>Landing</td>
<td>During landing, the airplane touched down short of the runway. The left main landing gear collapsed prior to the airplane stopping on the runway. There were no injuries.</td>
<td>Substantial</td>
<td>None</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-Sep-15</td>
<td>CEBA Intercontinental</td>
<td>737-800 (2)</td>
<td>Sched Pax</td>
<td>Malabo, Equatorial Guinea</td>
<td>Cruise</td>
<td>The airplane sustained damage while in cruise when another airplane impacted its winglet. The second airplane, an HS-125, with seven occupants, has not been found.</td>
<td>Minor</td>
<td>None</td>
<td>Fatal</td>
<td>(7)</td>
<td></td>
</tr>
<tr>
<td>8-Sep-15</td>
<td>British Airways</td>
<td>777-200 (17)</td>
<td>Sched Pax</td>
<td>Las Vegas, USA</td>
<td>Takeoff</td>
<td>The airplane sustained damage during rejected takeoff, when smoke and flames emitted from the No. 1 engine. There were minor injuries sustained during the evacuation.</td>
<td>Substantial</td>
<td>None</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-Oct-15</td>
<td>Starbow</td>
<td>BAE 146-300 (27)</td>
<td>Sched Pax</td>
<td>Tamale, Ghana</td>
<td>Landing</td>
<td>The airplane sustained damage during landing when it overran the end of the runway and the nose landing gear collapsed. There were no injuries.</td>
<td>Substantial</td>
<td>None</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-Oct-15</td>
<td>Tristar</td>
<td>A300 (35)</td>
<td>Charter Cargo</td>
<td>Mogadishu, Somalia</td>
<td>Initial Approach</td>
<td>The airplane sustained damage when it ran out of fuel and was forced to land in a field. Minor injuries were sustained by the crew.</td>
<td>Destroyed</td>
<td>X</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23-Oct-15</td>
<td>Peruvian Airlines</td>
<td>737-300 (25)</td>
<td>Sched Pax</td>
<td>Cuzco, Peru</td>
<td>Landing</td>
<td>The airplane sustained damage during landing when the right main landing gear collapsed. There were no injuries.</td>
<td>Substantial</td>
<td>X</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-Oct-15</td>
<td>Comair</td>
<td>737-400 (22)</td>
<td>Sched Pax</td>
<td>Johannesburg, South Africa</td>
<td>Landing</td>
<td>The airplane sustained damage during landing when the left main landing gear collapsed. There were no injuries.</td>
<td>Substantial</td>
<td>X</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29-Oct-15</td>
<td>Dynamic Aviation</td>
<td>737-200 (30)</td>
<td>Sched Pax</td>
<td>Ft. Lauderdale, USA</td>
<td>Taxi</td>
<td>The airplane sustained damage during taxi when fire was emitted from an engine. There were minor injuries sustained during the evacuation.</td>
<td>Substantial</td>
<td>X</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Nov-15</td>
<td>Shaheen Air International</td>
<td>737-400 (23)</td>
<td>Sched Pax</td>
<td>Lahore, Pakistan</td>
<td>Landing</td>
<td>The airplane sustained damage during landing when, after touchdown, the landing gear failed. There was a subsequent veer-off. There were minor injuries sustained during the evacuation.</td>
<td>Substantial</td>
<td>X</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-Nov-15</td>
<td>Batik Air</td>
<td>737-900ER (2)</td>
<td>Sched Pax</td>
<td>Yogyakarta, Indonesia</td>
<td>Landing</td>
<td>The airplane sustained damage when it overran the end of the runway and the nose landing gear collapsed. There were no injuries.</td>
<td>Substantial</td>
<td>X</td>
<td>None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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# 2015 Airplane Accidents

## All Accidents | Worldwide Commercial Jet Fleet

<table>
<thead>
<tr>
<th>Event Date</th>
<th>Airline</th>
<th>Model (Age in Years)</th>
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<th>Accident Location</th>
<th>Phase of Flight</th>
<th>Event Description</th>
<th>Damage Category</th>
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<th>Injury Category</th>
<th>Onboard Fatalities/ Occupants (External Fatalities)</th>
<th>Major Accident</th>
</tr>
</thead>
<tbody>
<tr>
<td>22-Nov-15</td>
<td>Avia Traffic Company LLC</td>
<td>737-300 (25)</td>
<td>Sched Pax</td>
<td>Osh, Kyrgyzstan</td>
<td>Landing</td>
<td>The airplane sustained damage during a hard landing, subsequent landing gear collapse, and runway veer-off.</td>
<td>Substantial</td>
<td>X</td>
<td>Serious</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-Nov-15</td>
<td>Magnicharters</td>
<td>737-300 (27)</td>
<td>Sched Pax</td>
<td>Mexico City, Mexico</td>
<td>Landing</td>
<td>The airplane sustained damage during landing when the left main landing gear collapsed. There were no injuries.</td>
<td>Substantial</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-Dec-15</td>
<td>Air India</td>
<td>A319 (7)</td>
<td>Sched Pax</td>
<td>Mumbai, India</td>
<td>Load/Unload</td>
<td>While preparing for departure, during engine start, an engineer was ingested into an engine.</td>
<td>Minor</td>
<td></td>
<td>Fatal</td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>21-Dec-15</td>
<td>KalStar Aviation</td>
<td>ERJ 195 (9)</td>
<td>Sched Pax</td>
<td>Kupang, Indonesia</td>
<td>Landing</td>
<td>The airplane sustained damage during landing when it overran the end of the runway and the landing gear collapsed. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-Dec-15</td>
<td>Services Air</td>
<td>A310 (30)</td>
<td>Sched Cargo</td>
<td>Mbilu-Mayi, Democratic Republic of the Congo</td>
<td>Landing</td>
<td>The airplane sustained damage during landing when it overran the end of the runway and impacted residential buildings.</td>
<td>Substantial</td>
<td>X</td>
<td>Fatal</td>
<td>0/5 (8)</td>
<td>X</td>
</tr>
<tr>
<td>24-Dec-15</td>
<td>Mahan Air</td>
<td>A310 (24)</td>
<td>Sched Pax</td>
<td>Istanbul, Turkey</td>
<td>Taxi</td>
<td>The airplane sustained damage after landing, when it failed to stop at the stand and impacted a barrier. The nose landing gear collapsed. There were no injuries.</td>
<td>Substantial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total Accidents | | | |
|-----------------| | | 15 |

**Note:** At the time this statistical summary was compiled, missing Malaysia Airlines Flight 370 did not meet the criteria for being categorized as an airplane accident, per the definition of this publication. The search for the wreckage is still underway, and therefore Flight 370 is not included in the summary's accident statistics.
## Accident Summary by Type of Operation

### Worldwide Commercial Jet Fleet

<table>
<thead>
<tr>
<th>Type of Operation</th>
<th>All Accidents</th>
<th>Fatal Accidents</th>
<th>Onboard Fatalities (External Fatalities)*</th>
<th>Hull Loss Accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger</td>
<td>1,525</td>
<td>312</td>
<td>495</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scheduled</td>
<td>1,404</td>
<td>288</td>
<td>449</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charter</td>
<td>121</td>
<td>24</td>
<td>46</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cargo</td>
<td>289</td>
<td>63</td>
<td>80</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance test, ferry, positioning, training, and demo</td>
<td>124</td>
<td>11</td>
<td>44</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>1,918</td>
<td>386</td>
<td>619</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. and Canadian operators</td>
<td>571</td>
<td>69</td>
<td>182</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rest of the world</td>
<td>1,347</td>
<td>317</td>
<td>437</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>1,918</td>
<td>386</td>
<td>619</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*External fatalities include on-ground fatalities as well as fatalities on other aircraft involved.
Accident Summary by Injury and Damage
All Accidents | Worldwide Commercial Jet Fleet

Number of Accidents | 1959 through 2015

- 619 Fatal accidents (32% of total)
  - 502 fatal accidents with hull loss
  - 27 fatal accidents with substantial damage
  - 90 fatal accidents without substantial damage
- 1,299 Non-fatal accidents (68% of total)
  - 471 hull loss without fatalities
  - 761 substantial damage without fatalities
  - 67 accidents without substantial damage, but with serious injuries
Total 1,918

Number of Accidents | 2006 through 2015

- 65 Fatal accidents (17% of total)
  - 55 fatal accidents with hull loss
  - 2 fatal accidents with substantial damage
  - 8 fatal accidents without substantial damage
- 321 Non-fatal accidents (83% of total)
  - 104 hull loss without fatalities
  - 198 substantial damage without fatalities
  - 19 accidents without substantial damage, but with serious injuries
Total 386
Accident Rates and Onboard Fatalities by Year
Worldwide Commercial Jet Fleet | 1959 through 2015
10-Year Accident Rates by Type of Operation

*Charter passenger, charter cargo, scheduled cargo, maintenance test, ferry, positioning, training, and demonstration flights
# Accident Rates by Airplane Type


<table>
<thead>
<tr>
<th>Sorted by year of introduction</th>
<th>Hull losses</th>
<th>Hull losses w/fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;No longer in service&quot;</td>
<td>99</td>
<td>53</td>
</tr>
<tr>
<td>707/720</td>
<td>153</td>
<td>74</td>
</tr>
<tr>
<td>DC-8</td>
<td>75</td>
<td>51</td>
</tr>
<tr>
<td>727</td>
<td>94</td>
<td>55</td>
</tr>
<tr>
<td>DC-9</td>
<td>92</td>
<td>49</td>
</tr>
<tr>
<td>BAC 1-11</td>
<td>27</td>
<td>12</td>
</tr>
<tr>
<td>737-100/-200</td>
<td>102</td>
<td>52</td>
</tr>
<tr>
<td>F-28</td>
<td>43</td>
<td>22</td>
</tr>
<tr>
<td>747-100/-200/300/SP</td>
<td>37</td>
<td>19</td>
</tr>
<tr>
<td>DC-10/MD-10</td>
<td>27</td>
<td>12</td>
</tr>
<tr>
<td>L-1011</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>A300</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>MD-80/-90</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>767</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>757</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>BAe 146, RJ-70/85/100</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>A310</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>737-300/-400/500</td>
<td>48</td>
<td>19</td>
</tr>
<tr>
<td>A300-600</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>A320/321/319/318</td>
<td>25</td>
<td>12</td>
</tr>
<tr>
<td>F-100/-F-70</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>747-400</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>MD-11</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>A340</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>A330</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>777</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>737-600/-700/-800/-900</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>717</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CRJ-700/-900/-1000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>EMB-170/-175/-190/-195</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td><strong>A380</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>747-8</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>787</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>A350</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>973</td>
<td>502</td>
</tr>
</tbody>
</table>

- Hull loss accident rate—total bar
- Hull loss with fatalities accident rate

* The Comet, CV880/990, Caravelle, Concorde, Mercure, Trident, and VC-10 are no longer in commercial service.
* These types have accumulated fewer than 1 million departures.
Fatal Accidents and Onboard Fatalities by Phase of Flight


Percentage of fatal accidents and onboard fatalities

<table>
<thead>
<tr>
<th>Phase of Flight</th>
<th>Taxi, load/unload, parked, tow</th>
<th>Takeoff</th>
<th>Initial climb (flaps up)</th>
<th>Climb</th>
<th>Cruise</th>
<th>Descent</th>
<th>Initial approach</th>
<th>Final approach</th>
<th>Landing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal accidents</td>
<td>11%</td>
<td>6%</td>
<td>6%</td>
<td>6%</td>
<td>12%</td>
<td>2%</td>
<td>8%</td>
<td>26%</td>
<td>23%</td>
</tr>
<tr>
<td>Onboard fatalities</td>
<td>0%</td>
<td>5%</td>
<td>3%</td>
<td>6%</td>
<td>24%</td>
<td>0%</td>
<td>14%</td>
<td>27%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Exposure (Percentage of flight time estimated for a 1.5-hour flight)

- Taxi, load/unload, parked, tow: 1%
- Takeoff: 1%
- Initial climb (flaps up): 14%
- Climb: 57%
- Cruise: 11%
- Descent: 12%
- Initial approach fix: 3%
- Final approach fix: 1%
- Landing: 47%

Note: Percentages may not sum to 100% due to numerical rounding.

Distribution of fatal accidents and onboard fatalities

- Onboard fatalities
- Fatal accidents
CAST/ICAO Common Taxonomy Team (CICTT)
Aviation Occurrence Categories

The International Civil Aviation Organization (ICAO) and the Commercial Aviation Safety Team (CAST), which includes government officials and aviation industry leaders, have jointly chartered the CAST/ICAO Common Taxonomy Team (CICTT). CICTT includes experts from several air carriers, aircraft manufacturers, engine manufacturers, pilot associations, regulatory authorities, transportation safety boards, ICAO, and members from Canada, the European Union, France, Italy, the Netherlands, the United Kingdom, and the United States. CICTT is co-chaired by one representative each from ICAO and CAST.

The team is charged with developing common taxonomies and definitions for aviation accident and incident reporting systems. Common taxonomies and definitions establish a standard industry language, thereby improving the quality of information and communication. With this common language, the aviation community’s capacity to focus on common safety issues is greatly enhanced.

The CICTT Aviation Occurrence Taxonomy is designed to permit the assignment of multiple categories as necessary to describe the accident or incident. Since 2001, the Safety Indicator Steering Group (SISG) has met annually to assign CICTT occurrence categories to the prior year’s accidents.

In a separate activity, the CAST assigned each fatal accident to a single principal category. Those accident assignments and a brief description of the categories are reported in the following chart.

The CAST use of principal categories has been instrumental in focusing industry and government efforts and resources on accident prevention. Charts using principal categories are used by CAST to identify changes to historic risk and to help to determine if the safety enhancements put in place are effective.

For a complete description of the categories, go to www.intlaviationstandards.org.
Fatalities by CICTT Aviation Occurrence Categories

- External fatalities (total 105)
- Onboard fatalities (total 3,191)

Note: Principal categories as assigned by CAST.
For a complete description of CAST/ICAO Common Taxonomy Team (CICTT) Aviation Occurrence Categories, go to www.intlaviationstandards.org.

22 | 2015 STATISTICAL SUMMARY, JULY 2016
To: Planning Commission
From: Stephen Atkinson, Principal Planner
Subject: Future Land Use Map Implementation – Potential Rezones
Meeting Date: December 19, 2018
Memo Date: December 13, 2018

Action Requested:
Guidance on options for developing an initial draft potential rezone map.

Discussion:
At the meeting on December 19, 2018, staff will present options for use in developing an initial potential rezone map. This is a follow up discussion from the September 19th presentation and guidance provided by the Commission. The attached FLUM: Options Analysis document identifies two issues:

1. Transitional Zoning Districts in a Multifamily Low-Density Designation;
2. Puyallup Tribal Trust properties that are within the scope of work of the FLUM and Commercial Zoning projects.

With concurrence from the Planning Commission, staff would apply the approach for each issue to generate a FLUM and Zoning Amendment Review Draft for the Commission’s consideration.

Project Summary:
The Future Land Use Map, Figure 2 of the One Tacoma Comprehensive Plan, illustrates the City’s intended future land use pattern through the geographic distribution of residential and commercial areas, the designation of mixed-use and manufacturing/industrial centers, as well as shoreline and single-family detached designations. These designations correspond to specific zoning districts and use and development standards that implement the policies of the One Tacoma Plan.

Per the Washington State Growth Management Act and the Tacoma Municipal Code, the City’s Land Use Regulations, including zoning districts, should be consistent with the policies of the One Tacoma Plan. However, in many areas throughout the City current zoning is inconsistent with the Land Use Designation in the Future Land Use Map. This project will seek to improve the consistency between the One Tacoma Plan and implementing zoning.

Prior Actions:
- 5/2/2018 – Reviewed draft scope of work for Future Land Use Map Implementation project.
- 6/20/2018 – Approved an amended scope of work and recommended the work program to the City Council Infrastructure, Planning and Sustainability Committee.
- 9/5/2018 – The Commission reviewed background information on the City’s growth targets, buildable lands capacity, and current permit trends.
• 9/19/2018 – The Commission reviewed an Options Analysis and provided direction to City staff on how to resolve the identified issues for the preparation of a preliminary rezone map.

Staff Contact:
• Stephen Atkinson, Principal Planner, satkinson@cityoftacoma.org, (253) 591-5531.

Attachments:
A. FLUM: Options Analysis.

c: Peter Huffman, Director
Future Land Use Implementation
2019 Amendment

The Future Land Use Map, Figure 2 of the One Tacoma Plan, illustrates the City’s intended future land use pattern through the geographic distribution of residential and commercial areas, the designation of mixed-use and manufacturing/industrial centers, as well as shoreline and single-family detached designations. These designations correspond to specific zoning districts and use and development standards that implement the policies of the One Tacoma Plan.

Per the Washington State Growth Management Act and the Tacoma Municipal Code, the City’s Land Use Regulations, including zoning districts, should be consistent with the policies of the One Tacoma Plan. However, in many areas throughout the City current zoning is inconsistent with the Land Use Designation in the Future Land Use Map. This project will seek to improve the consistency between the One Tacoma Plan and implementing zoning.

Outcomes of this project are intended to support the development of compact, complete and connected neighborhoods with a variety of housing choices and employment opportunities in close proximity to schools, parks, transit, and other amenities.

| Project Summary |
|-----------------|--------------------------------------------------|
| Applicant:      | Planning and Development Services                |
| Location and Size of Area: | Citywide                                        |
| Current Land Use and Zoning: | Multiple                                        |
| Neighborhood Council Area: | This application will include potential rezones in all Neighborhood Council districts. |
| Type of Amendment: | Plan and Zoning Amendment                        |
| Staff Recommendation: | Release the Draft Scope of Work and Assessment Report for Public Review and Comment. |
| Project Proposal: | This project will do the following:               |
|                 | • Identify areas where the Plan and Zoning are inconsistent; |
|                 | • Evaluate options for bringing the Plan and Zoning into compliance; |
|                 | • Recommend amendments to the Future Land Use Map or area-wide rezones to ensure that the Plan and Zoning are mutually supportive and consistent. |
Area of Applicability

Areas subject to this review and potential amendment are located City-wide. The following map shows the location and distribution of sites where the current Residential Land Use Designation and Zoning are inconsistent and subject to review. An interactive map is available at https://wspdsmap.cityoftacoma.org/website/FLUM/ to enable a closer identification of properties subject to review. The colors on the map indicate the proposed Designation in the One Tacoma Plan.
Options Analysis

On September 19, 2018, the Commission reviewed an initial Options Analysis with a staff assessment of specific issues to be resolved for the development of preliminary Future Land Use Map and Zoning Map amendments. As staff have begun working with Berk Consulting on the implementation of the Commission’s guidance, two further issues have emerged for Commission consideration. The following is a summary of the issue and staff recommendations on how to address these issues at this stage of the process.

Issue 1: Transitional Zoning Districts

The Issue: In some cases, properties are identified in the Future Land Use Map for multifamily development, but are currently zoned T-Transitional District, which is considered a commercial zoning district. This is primarily the result of Transitional District rezones that were approved primarily for residential developments. However, the Transitional District (T) is considered a commercial zoning district, allowing a mix of commercial and residential use. Permitted uses in the T-District include small-scale office space, daycares, schools, parks, religious facilities, group housing, and retirement homes. The maximum building height in the district is 35 feet.

- Staff Recommended Approach: At this time, staff recommends amending the Future Land Use Map to Neighborhood Commercial, which would reflect the Transitional Zoning District as previously approved and the potential for commercial use in the future. While these properties are predominantly residential, the rezone to the T-District implied some allowance for commercial activity and mixed-use. The impact of re-designating these areas to Neighborhood Commercial is that it enables property owners to apply for future rezones to C-1 Neighborhood Commercial Zoning.

- Alternative Approach 1: The Commission could alternatively consider rezoning these Transition Districts to the closest residential zone that matches the existing development. This approach may result in some established commercial uses becoming non-conforming as well as the removal of any concomitant zoning agreements that may be in place for these rezones. Concomitant zoning agreements may place further controls on the use of the property. These are rezone specific agreements that the City often relied on in

Type 2: Tribal Trust Properties

The Issue: In certain cases, properties that are within the scope of the potential rezones (both the residential and commercial phases) are Trust Properties of the Puyallup Tribe of Indians that are not subject to City of Tacoma zoning and land use regulations. However, this jurisdictional issue is not readily identifiable in the City’s Future Land Use Map or Zoning Map. This issue will require consultation with the Puyallup Tribe of Indians and coordination with the Tribe to ensure an accurate assessment of properties within the scope of work that are subject to Puyallup Tribe jurisdiction.

- Staff Recommended Approach: At this time staff recommends an identification of these properties as Tribal Trust Properties and continued consultation with the Puyallup Tribe to identify the most appropriate way of recognizing Tribal jurisdiction within the Comprehensive Plan and the Future Land Use map. Staff will evaluate a methodology to more clearly acknowledge the jurisdiction of the Puyallup Tribe of Indians within this project and the Comprehensive Plan more broadly.

In the examples below the shaded properties are in Tribal Trust status, while the outlined properties are properties within the scope of the potential rezones (either multifamily or commercial designated).
Example 1: Emerald Queen Casino and Tribal Cemetery.

Example 2: Portland Ave and 38th Street.
Example 3: Norpoint Way and 29th.
To: Planning Commission
From: Brian Boudet, Manager, Planning Services Division
Subject: Planning Commission Year-End Review
Meeting Date: December 19, 2018
Memo Date: December 12, 2018

Action Requested:
Guidance.

Discussion:
At the meeting on December 19, 2018, staff will facilitate a year-end review for the Planning Commission to celebrate the accomplishments during 2018, while planning for the work activities for 2019 and beyond. The Commission will also take the opportunity to address certain logistical and administrative issues, if any, to improve its conduct of business. To facilitate the Commission’s review, attached are the Planning Commission Work Program 2018-2020 and the Planning Commission's Rules and Regulations (i.e., By-laws).

Staff Contact:
• Brian Boudet, Planning Manager, bboudet@cityoftacoma.org, (253) 573-2389

Attachment:
• Planning Commission Work Program 2018-2020 (June 20, 2018)
• Planning Commission's Rules and Regulations (August 1, 2018)

c. Peter Huffman, Director
**Planning Commission Work Program (2018-2020)**  
**Planning Commission Recommendation**  
*June 20, 2018*

### Expected Completion in 2018

<table>
<thead>
<tr>
<th>Regulations/Program</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correctional and Detention Facilities Permanent Regulations</td>
<td>Adopted Feb. 2018</td>
</tr>
<tr>
<td>Homeless Emergency Temporary Shelters Permanent Regulations</td>
<td>Adopted April 2018</td>
</tr>
<tr>
<td>Tacoma Mall Neighborhood Subarea Plan</td>
<td>Adopted May 2018</td>
</tr>
<tr>
<td>2018 Amendment Package</td>
<td>Expected Adoption June 2018</td>
</tr>
<tr>
<td>• Car Washes Uses in Neighborhood Centers <em>(Private Application)</em></td>
<td><em>(Denied)</em></td>
</tr>
<tr>
<td>• Outdoor Tire Storage Code Amendment <em>(Private Application)</em></td>
<td></td>
</tr>
<tr>
<td>• South 80th Street PDB Rezone <em>(Private Application)</em></td>
<td></td>
</tr>
<tr>
<td>• View Sensitive District (VSD) Height Measurement <em>(Private Application)</em></td>
<td><em>(Deferred)</em></td>
</tr>
<tr>
<td>• Transportation Master Plan – Limited Update</td>
<td></td>
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<tr>
<td>• Open Space Corridors – Phase 1 (Biodiversity Corridors)</td>
<td></td>
</tr>
<tr>
<td>• Code and Plan Clean-ups</td>
<td></td>
</tr>
</tbody>
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### 2019-2024 Capital Facilities Program (CFP)

- Expected Adoption October 2018

- **Open Space Current Use Assessment Request** *(Private Application)*

- **Tideflats Interim Regulations – Extension** *(every 6 months)*  
  - Expected Decision November 2018

- **Accessory Dwelling Units (ADUs) – Permanent Regulations**
**Expected Completion in 2019**

**JBLM Accident Potential Zone**

**Tideflats Interim Regulations – Extension (every 6 months)**

**2019 Amendment Package**

- FLUM Implementation – Phase 2: Residential Area-wide Rezones
- Commercial Zoning Update – Phase 1: Revised Commercial Zoning Framework
- Shoreline Master Program – 2019 Periodic Review
- Manitou Annexation – Plan and Zoning Amendments
- Historic Preservation Code Improvements – Demolition Review
- Plan and Code Minor Amendments

**Infill Pilot Program – Phase 1B: Program Modifications** *(may be consolidated with Affordable Housing Action Strategy project, below)*

**Affordable Housing Action Strategy – Land Use/Zoning Implementation** *(scope/phasing TBD)*

**Pacific Avenue Corridor Plan** *(tied to Pacific Ave. BRT)*

**Tideflats Interim Regulations – Extension (every 6 months)**

**Expected Completion in 2020  (very preliminary)**

**Tideflats Interim Regulations – Extension (every 6 months)**

**Open Space Corridors – Phase 2 (Geohazard Areas)**

**Urban Design Program – Development/Creation**

**2020 Amendment Package**

- Private Applications
- Institutional Zoning Review
- Downtown Plan Integration
- Infill Pilot Program – Phase 2: Permanent Regulations *(may be consolidated with Affordable Housing Action Strategy project, above)*
- Transportation Master Plan Update (coordinated with TC and PW)
- Plan and Code Minor Amendments

**2021-2026 Capital Facilities Program (CFP)**

**Tideflats Subarea Plan**
### On-going Planning Issues

- Six-Year Comprehensive Transportation Program
- Joint Meetings of the Planning Commission with appropriate groups (e.g., the Landmarks Preservation Commission, the Transportation Commission, and the Neighborhood Councils)
- Transportation Master Plan Implementation, in coordination with the Transportation Commission (e.g. impact fees study, transportation network planning, streetscape design guidance, signature trails development, etc.)
- Light Rail Expansion projects (including the Hilltop Links to Opportunity Program, ST3 Tacoma Dome Link Extension, Tacoma Link Extension, etc.)
- Historic Preservation, in coordination with the Landmarks Preservation Commission (e.g. TDR, integration of Historic Preservation Plan with One Tacoma Plan, educational programs, etc.)
- Tacoma Mall Neighborhood Subarea Plan (and others) - Implementation
- Residential Infill Pilot Program – Implementation and project reviews
- Citizen Participation and Public Outreach Enhancements

### Regional and Cross-Jurisdictional Issues

- Metro Parks Tacoma and Tacoma School District strategic plans updates
- Pierce County Parkland/Spanaway/Midland (PSM) Community Plan
- Regional Transportation Issues, in coordination with the Transportation Commission (e.g. Tacoma LINK and Central LINK Light Rail Expansions, Pacific Avenue BRT Study)
- PSRC Regional Centers Framework Update, Vision 2050, GMA review, Buildable Lands
- PCRC Centers of Local Importance/County-level Centers Update

### Emerging and Deferred Issues

- Urban Forestry Implementation (landscaping, tree-preservation, open space, etc.)
- Parking Update (RPA, refinements along light rail, Mixed-Use Centers, design, etc.)
- Potential Local Historic Districts – coordinated with LPS (College Park, Stadium, etc.)
- 20-minute Neighborhood and Urban Growth Baseline Analysis
- Street Typology and Designation System Review
- Mixed-Use Centers Implementation Programming (Master Planning, Revitalization Strategies)
- Mixed-Use Centers Height Bonus Program Review (*maybe part of Affordable Housing*)
- MUC Core/Pedestrian Street Review (*maybe part of Design Review*)
- Downtown Subarea Plans – Periodic Review/Update
- Form-based Residential Standards (lot coverage, FAR, etc.)
- Watershed-level Environmental Planning
- Unified Development Code
- Transfer of Development Rights (TDR) Program Review
- Sign Code Update
- Pre-Annexation Planning (Browns Point/Dash Point, Parkland/Spanaway)
- Greenhouse Gas standards and review
Project Summaries

2019-2024 Capital Facilities Program (CFP)

Summary:
The Growth Management Act (GMA) requires a capital facilities element of the comprehensive plan that is to be periodically reviewed and updated. This element serves as a planning document for capital projects and enables the City to seek funding for potential projects. The element is updated each biennium through development of the City’s six-year Capital Facilities Program (CFP).

The CFP is currently being updated from 2017-2022 to 2019-2024. The update focuses on adding new capital projects, removing completed projects, and consolidating some projects.

Primary Staff Contact:
Christina Watts Curran, Lead Management Analyst
christina.curran@cityoftacoma.org

General Project Timeline:
April 2018 – November 2018

Open Space Current Use Assessment Request (Private Application)

Summary:
The City has received an application from a private property owner for an Open Space Current Use Assessment. Through this process, land owners can apply to have their open space lands valued, for tax purposes, at their current use value rather than at the highest and best use that would be permitted by zoning, which provides an incentive to maintain the land as open space. The City and Pierce County jointly review Current Use Assessment applications within the City.

Primary Staff Contact:
Elliott Barnett, Associate Planner
elliott.barnett@cityoftacoma.org

General Project Timeline:
June 2018 – September 2018
**Tideflats Interim Regulations – Extension (every 6-months)**

**Summary:**
The Council adopted Interim Regulations for the Tideflats Area in November 2017. The interim regulations include temporary use restrictions, modified permit procedures and enhancements to public notice, and limits on development in adjacent slopes and transition areas. These interim regulations are intended to be in place until permanent regulations are adopted as part of the Tideflats Subarea Plan. Per State Law and City Code, interim regulations are required to be reauthorized every six months.

**Primary Staff Contact:**
Stephen Atkinson, Principal Planner
satkinson@cityoftacoma.org

**General Project Timeline:**
August 2018 – October 2018; and every six-months thereafter, until adoption of permanent regulations

**Detached Accessory Dwelling Units (DADUs) – Permanent Regulations**

**Summary:**
Detached Accessory Dwelling Units (DADUs) were a part of the City’s Infill Pilot Program. During the first part of the Round 1 Selection of Projects, the three available Detached Accessory Dwelling Units in single-family zoning districts were all selected. This project would build upon the lessons learned regarding DADUs though the pilot program, as well as the experiences of other jurisdictions and insights from community outreach, to evaluate the potential for permanent regulations regarding detached ADUs in single-family zones in Tacoma.

**Primary Staff Contact:**
Lauren Flemister, Senior Planner
lflemister@cityoftacoma.org

**General Project Timeline:**
June 2018 – November 2018
JBLM Accident Potential Zone

Summary:
This project will evaluate the findings and recommendations of the Joint Land Use Study for Joint-Base Lewis-McChord and evaluate strategies for addressing compatibility with the base, with specific focus on the Accident Potential Zone (APZ).

Primary Staff Contact:
Elliott Barnett, Associate Planner
elliott.barnett@cityoftacoma.org

General Project Timeline:
June 2018 – January 2019

Future Land Use Map Implementation – Phase 2: Residential Area-wide Rezones

Summary:
The Future Land Use Map of the Comprehensive Plan provides a basis for applying zoning and for making land use decisions. This project will put into effect the land use designations through appropriate area-wide rezones to achieve consistency with the Future Land Use Map, and work to achieve the goals of the One Tacoma Plan, with this phase focusing on addressing inconsistencies in residentially-zoned areas.

Primary Staff Contact:
Stephen Atkinson, Principal Planner
satkinson@cityoftacoma.org

General Project Timeline:
March 2018 – June 2019
Commercial Zoning Update – Phase 1: Revised Commercial Zoning Framework

Summary:
The Commercial Zoning update will revise the design and development standards for the City’s Neighborhood and General Commercial zoning districts. The project will bring these districts into alignment with the goals and policies of the One Tacoma Plan to promote more context-sensitive commercial zoning standards. This first phase will focus on creating a new commercial zoning framework that would then be implemented through code changes and rezones in a next phase.

This project may involve the creation or consolidation of existing commercial zoning districts.

Primary Staff Contact:
Stephen Atkinson, Principal Planner
satkinson@cityoftacoma.org

General Project Timeline:
May 2018 – June 2019

Shoreline Master Program – 2019 Periodic Update

Summary:
The State Shoreline Management Act requires local governments to periodically review their shoreline master programs and make any adjustments deemed necessary to reflect changing local circumstances, new information or improved data. Per State Law, the City of Tacoma is required to conduct a periodic review before the end of June 2019. The initial public scoping phase of the project will inform what information, issues, and topics are pertinent for this periodic review.

Primary Staff Contact:
Stephen Atkinson, Principal Planner
satkinson@cityoftacoma.org

General Project Timeline:
March 2018 – June 2019
Historic Preservation Code Improvements – Demolition Review

Summary:
This proposal seeks to improve the effectiveness of the Historic Preservation Program through a series of code amendments, including: enhancement of demolition/cultural resources impact review; clarification of the nomination and designation process and project review; and updates to the Historic Conditional Use Permit process. Companion amendments regarding the composition of the Landmarks Commission are also being considered.

Primary Staff Contact:
Reuben McKnight, Historic Preservation Officer
reuben.mcknight@cityoftacoma.org

General Project Timeline:
March 2018 – June 2019

Plan and Code Minor Amendments

Summary:
As part of the 2019 Amendment Package, this proposal would amend the Land Use Regulatory Code to keep information current, address inconsistencies, correct errors and clarify code language, in order to improve code administration efficiency and enhance customer service.

Primary Staff Contact:
Lihuang Wung, Senior Planner
lwung@cityoftacoma.org

General Project Timeline:
June 2018 – June 2019
Manitou Annexation – Plan and Zoning Amendments

Summary:
Pierce County and the City of Tacoma are planning to conduct a joint review of the Manitou Neighborhood in order to inform the decision for the potential annexation of the area to the City. The annexation study would include evaluation of issues such as appropriate zoning and plan designations and policies, utility infrastructure, services and costs, and community amenities, taxes and representation. The review is expected to be initiated by Pierce County Council and Tacoma City Council in June-July 2018.

Note: As this project will likely necessitate changes to the One Tacoma Comprehensive Plan, it will likely need to be incorporated into the 2019 Amendment Package.

Primary Staff Contact:
Lihuang Wung, Senior Planner
lwung@cityoftacoma.org

General Project Timeline:
May 2018 – June 2019

Residential Infill Pilot Program – Phase 1B: Program Modifications

Summary:
The purpose of the Pilot Program is to promote innovative residential infill development types. The program was adopted in 2015 and the first phase of implementation is in progress. Four projects submitted by interested developers have been selected to move into the permitting process.

This phase of implementation will consider lessons learned from completed and approved projects, as well as projects that were not submitted and/or were not approved, to evaluate code amendments to the infill code and guidelines that could support the continued implementation of the program.

Primary Staff Contact:
Lauren Flemister, Senior Planner
lflemister@cityoftacoma.org

General Project Timeline:
June 2018 – June 2019
Affordable Housing Action Strategy – Land Use/Zoning Implementation

Summary:
The City’s Housing Division is currently working with the City Council to put together a comprehensive Action Strategy on Affordable Housing. The Action Strategy, which is expected to be complete in July 2018, will identify and evaluate various methods for addressing this high priority issue that reflects better programmatic alignment throughout the City of Tacoma and its community partners. It is expected that this Action Strategy will include numerous items that directly relate to planning and zoning issues and potential code and/or plan amendments.

Note: Depending on the scope of this project, it may involve multiple phases.

Primary Staff Contact:
TBD

General Project Timeline:
TBD

Pacific Avenue Corridor Plan

Summary:
The Pacific Avenue Bus Rapid Transit proposal, part of the Sound Transit 3 package, is poised to spur revitalization of a critical corridor within Tacoma that includes two designated Mixed-use Centers and a neighborhood business district. This Corridor Plan is designed to maximize the impact of this significant transit investment and facilitate this revitalization through a unique transit-oriented development planning project that would focus on redevelopment, capital investment, livability, supporting existing and encouraging new business activity, and conducting area-wide environmental review along the corridor.

Note: This project is considered as a potential partnership between agencies including Planning and Development Services, Public Works, Utility providers, Pierce Transit, Tacoma-Pierce County Health Department, etc.

Primary Staff Contact:
TBD

General Project Timeline:
November 2018 – November 2019
Open Space Corridors – Phase 2: Geo-hazard Areas

Summary:
This effort focuses on Critical Areas standards for development and disturbance within and around erosion and landslide hazard areas—types of Geologically Hazardous Areas associated with steep slopes. Tacoma’s standards for Geologically Hazardous Areas are due for an update to reflect recent statutory amendments and the Best Available Science (BAS). The updates will address gaps and inconsistencies in the current code and integrate the latest science in order to more effectively limit risks to life and property in areas prone to landslides or erosion.

Primary Staff Contact:
Elliott Barnett, Associate Planner
elliott.barnett@cityoftacoma.org

General Project Timeline:
June 2019 – February 2020

Urban Design Program – Establishment

Summary:
The Urban Design Studio is a proposed long-term program with a focus on delivering urban design services to customers in the Planning and Development Services Department, to other City departments, and through external public and private partnerships.

The initial phase of this project will include extensive public engagement, development of design guidelines, administrative procedures, and municipal code amendments.

Note: This project will incorporate consideration of the issues highlighted in Private Application #2018-05 “Design Review in MUCs”

Primary Staff Contact:
Lauren Flemister, Senior Planner
lflemister@cityoftacoma.org

General Project Timeline:
July 2018 – February 2020
Summary:
The City Council adopted Amended Resolution No. 39723 on May 9, 2017, initiating the Tideflats subarea planning process. The resolution requested the Planning Commission to consolidate several planning initiatives currently underway for the area into a single, area-wide subarea planning effort and requested the City Manager to identify resources need for the subarea planning effort and negotiate an Interlocal Agreement with the Port and the Puyallup Tribe for collaboration of the project. The Interlocal Agreement is still being discussed between the potential partnership agencies and the specific scope of work and timeline for the subarea plan is yet to be determined.

Note: This project incorporates consideration of the issues highlighted in:
- NETNC’s “NE Tacoma Buffer Zone” Application #2018-04
- The Council Consideration Request pertaining to the implementation of the Port Container Element
- PDS Director’s Rule on Heavy Industrial Expanded Notification

Primary Staff Contact:
Stephen Atkinson, Principal Planner
satkinson@cityoftacoma.org

General Project Timeline:
Planned initiation in 2018
The following Rules and Regulations of the Tacoma Planning Commission were originally adopted by the Commission on July 6, 1954, and subsequently amended on January 29, 1964; April 20, 1970; July 21, 1980; September 4, 1991; August 16, 1993; August 21, 1995; May 21, 1997; June 7, 2000; October 20, 2004; November 18, 2009; December 1, 2010; August 5, 2015; June 1, 2016; December 6, 2017; and August 1, 2018. These Rules and Regulations conform to the statutory authority of the City Charter (Article III, Section 3.8 – City Planning Commission) and the Tacoma Municipal Code (TMC) (Title 13, Chapter 13.02 – Planning Commission).

The Rules and Regulations contain the following sections:

I. Officers
II. Advisory Committees and Task Forces
III. Staffing
IV. Meetings
V. Records
VI. Annual Report
VII. Miscellaneous
VIII. Rules and Regulations Amendments

I. Officers

A. The Commission shall elect its own Chair, Vice-Chair, and such other officers as from time to time it may determine it requires, all of whom shall be members of the Commission.

B. Nominations and elections of officers shall be conducted at the first meeting in September of each year or on a different date set by the Commission. New officers will assume duties after the meeting following their election.

C. Officer Qualification Considerations – The Officers should be interested in holding the position(s); be able to devote sufficient time to Commission business and attend as many Commission meetings as possible; be prepared to make presentations to the City Council, citizens, committees, neighborhood groups, and service clubs regarding Commission responsibilities, projects, plans and policies; and have sufficient experience on the Commission to understand its role and functions and to have a basic understanding of the City's Comprehensive Plan policies and development regulations.

D. The term of office shall be for one (1) year or until the next scheduled election. In case of any vacancy in office, the vacancy shall be filled by an election at the first regular meeting after the occurrence of such vacancy.
E. Duties of Officers – The Chair shall preside over all meetings of the Commission. All resolutions adopted by the Commission and Commission correspondence shall be signed in his/her name as Chair of the Commission. In the event of the absence of the Chair or his/her inability to act, the Vice-Chair shall take his/her place and perform his/her duties. In the event of the absences or inability to act of both the Chair and the Vice-Chair, the remaining members of the Commission shall appoint one of their members to temporarily act as Chair.

II. Advisory Committees and Task Forces

A. Advisory Committees – The Commission may establish advisory committees as it deems appropriate, following the procedures set forth in TMC 13.02.015.

B. Task Forces – The Commission may also establish task forces as it deems appropriate to conduct extended and supplemental analyses of issues identified and defined by the Commission. Task forces are ad-hoc and issue-oriented in nature and shall not be construed to have the same organization and operation as those of “advisory committees.” A task force shall be comprised of up to four (4) members of the Commission designated by the Commission by a majority vote. Chairpersons of task forces may be designated by the Chair of the Commission. There shall not be more than two task forces operating at any given time. Task forces shall serve at the discretion of the Commission and their duties and responsibilities shall be established by the Commission. All task force meetings shall be open to the public and conducted in accordance with these rules. Task forces may not conduct public hearings.

III. Staffing

The Long-Range Planning Division Manager and/or his/her designee (hereinafter referred to as Staff) shall organize and supervise clerical details of the Commission’s business and shall be responsible to the Commission for the proper preparation and maintenance of records of meetings, hearings, official actions and all public records. Staff shall be responsible for providing such other services as may be required by the Commission within the limits of the budget for the Planning and Development Services Department as approved by the City Council.

IV. Meetings

A. Regular Meetings – Regular public meetings of the Commission shall be held on the first and third Wednesday of each month at 5:00 p.m. in Room 16 of the Tacoma Municipal Building North, or in another location designated by the Commission. If the regular meeting day falls on a legal holiday, the Chair of the Commission shall fix another day therefore and give notice of said meeting as hereinafter providing for “special meetings.” The notice for any regular public meeting shall indicate the date, time, place and business to be transacted, and be distributed prior to the meeting to those individuals and organizations listed on the mailing list that shall be maintained by Staff and may be subject to the Commission’s approval.

B. Public Hearings – Public hearings conducted by the Commission shall be held in the Council Chambers of the Tacoma Municipal Building or another location designated by the Commission and indicated in the notice of hearing. The date and time of the hearing shall be determined by the Commission and indicated on the notice of hearing.
Notices for public hearings shall be distributed in accordance with TMC 13.02.057. Notices shall also be mailed, prior to the hearing, to those on the mailing list as hereinabove provided, to those individuals or organizations which have indicated in writing to the Planning and Development Services Department an interest in the subject(s) of the hearing, and to other interested parties as deemed appropriate by the Commission. An additional notice shall be required for matters continued for further hearing and continued to a time, date, and place certain.

C. Special Meetings – Special meetings of the Commission set for a time different than regularly scheduled as hereinabove provided shall be held at such times as the Commission may determine, or may be called by the Chair for any time upon the written request of three members of the Commission. Special meetings shall be open to the public. Per RCW 42.30.080, special meetings require at least 24 hours’ written notice. Such notice shall indicate the date, time, place and business to be transacted. Notices of special meetings shall be distributed to the same recipients of notices for regular public meetings, to the recipients on the special press mailing list on file with the City Clerk’s Office, and to other interested parties as deemed appropriate by the Commission.

D. Quorum – A quorum for the transaction of official business shall consist of a simple majority of appointed, filled positions of the Commission, per TMC 13.02.041.

E. Absences – Members are expected to attend Commission meetings and to fully participate in and contribute to the work of the Commission. Any member anticipating absence from a meeting should notify the Chair or Staff in advance, so that the absence may be excused by the Commission at the meeting. Any member who is absent from three consecutive meetings without being excused or six meetings in a calendar year, whether excused or unexcused, should be deemed to have forfeited the office and the Chair should recommend to the City Council that a new member be appointed to fill the unexpired term. When a member misses three meetings within a six-month period, the Chair should discuss with the member the implications of their lack of attendance and options for improvement. If the circumstances are expected to continue unimproved, the member may be asked to consider resigning from the Commission before reaching the above mentioned threshold of absences.

F. Every official act taken by the Commission shall be by resolution or by motion by an affirmative vote of a majority of the quorum. In the event that a member disqualifies themselves or passes, this is to be registered as "not voting". Notwithstanding Robert’s Rules of Order, the Chair shall vote on all resolutions or motions.

G. Conduct of Meetings

1. Order of Business – The following order of business may be modified for any meeting by a suspension of the rules, concurred in by a majority of the voting members present, except that consideration of matters set for public hearing must occur at or following the time indicated on the hearing notice:

   a) Call to Order and Quorum Call
   b) Approval of Agenda
   c) Approval of Minutes
d) Public Comment – The Chair shall decide whether this item will be included in the agenda, and if so, how much time will be allowed for each speaker. Public comments, if included in the agenda, must be limited to items on the agenda that are not the topic of a recent public hearing.

e) Discussion Items – Matters set for public hearing shall be considered at such time as determined by the Commission and set forth in the hearing notice.

f) Communication – This may include other business brought forward by Commissioners, comments by Commissioners, and comments and additional information provided by Staff.

g) Adjournment

2. Conduct of Regular and Special Meetings:

a) The Chair shall preside over all regular and special meetings of the Commission.

b) The Chair introduces the agenda items.

c) Staff and/or presenters invited by staff summarize the information prepared or received by the staff responsible for the agenda item.

d) The Commission considers requests and may ask questions of the staff and/or other presenters. Comments by the public on the agenda item under consideration may be permitted, but only at the discretion of the Chair.

e) The Chair asks for reports from advisory committees or task forces, if appropriate.

f) The Commission takes appropriate action, if an action is required.

3. Conduct of Public Hearings:

a) The Chair shall preside over all public hearings conducted by the Commission.

b) The Chair calls the public hearing to order and announces the procedure for the public hearing as established by the Commission.

c) Staff summarizes the staff report or other information prepared or received by the staff responsible for the hearing item.

d) The Chair asks for reports from advisory committees or task forces, if appropriate.

e) The Commission receives oral testimony.

f) The Chair either closes the hearing and announces the date upon which the record of the hearing will remain open to receive additional written comments, or continues the hearing to a later date if there is a finding by the Chair that all interested parties have not been afforded an adequate opportunity to testify before the Commission or if new information is to be considered on which the Commission feels additional public testimony to be appropriate.

g) At a meeting(s) subsequent to the public hearing, the Commission considers all oral and written testimony concerning the hearing item and acts to approve, disapprove, modify, or defer the decision-making until the completion of additional analyses.
H. Open Public Meetings Act and E-mail Exchanges

E-mail exchanges between members of the Commission can constitute a violation of the Washington State Open Public Meetings Act (OPMA), Chapter 42.30 RCW. Generally, if a majority of the members participate in an e-mail discussion of Commission business, the members are conducting a meeting in violation of the OPMA requirement that meetings must be “open to the public with prior notice.” It is suggested that Commission members observe the following guidelines to avoid OPMA problems with e-mail exchanges:

1. When possible, limit e-mail exchanges on issues related to Commission business to less than a majority of Commission members. Sending copies of an e-mail to less than a majority may not suffice if subsequent exchanges relay the content of the original exchange to a majority of members.

2. Never decide at an open meeting that a majority of the Commission will continue or complete discussion of an agenda item by e-mail.

3. One-sided (no response anticipated) informational e-mails to a majority or more of Commission members are probably consistent with the OPMA. In open meetings, the Commission members should verbally announce that they have sent this type of e-mail if it relates to the discussion at hand. Commission members are free to engage in e-mail exchanges with staff on one-sided e-mails, but not with each other.

4. E-mail exchanges on issues that the Commission will not address are consistent with the OPMA. However, if any reasonable chance exists that an issue relates to a vote that may or will come before the Commission, a majority of the Commission should not subject the issue to e-mail discussion.

V. Records

A. The Commission's adopted summary minutes of the public meetings shall be the official records. The actual recording of each hearing item shall be the official record for such item.

B. Supplemental records pertaining to matters of public meetings and public hearings shall be kept on file in the Planning and Development Services Department as required by law. These supplemental records may include but not be limited to the following:

1. Description of agenda items, including all submitted information therewith.
2. Report of the Planning and Development Services Department, Commission Advisory Committees and Task Forces on the matter as presented to the Commission at a meeting thereof, including such material submitted in writing and in map form.
3. Written communications concerning the matter.
4. Facts concerning the matter.
5. Records of all actions taken by the Commission in the matter (resolutions, motions, setting of dates for hearings, etc.).
6. Record of actions taken by the City Council in the matter (ordinances, resolutions, results of hearings, etc.).

C. Recorded transcripts or summary minutes of all official Commission proceedings shall be filed with the City Clerk and shall be opened to public inspection.

VI. Annual Report

Pursuant to TMC 13.02.040, the Commission shall annually report to the City Council regarding accomplishments and the status of planning efforts undertaken in the previous year, and if applicable, the outlook of planning issues for the coming year. Said report is typically prepared in July of each year and should, at the discretion of the Chair, take the form of a letter, a memorandum, a summary report or a copy of relevant minutes of the Commission's meetings, and may be posted on the City's website.

VII. Miscellaneous

A. Code of Ethics – Members of the Commission shall comply with the City of Tacoma's Code of Ethics pursuant to TMC 1.46 while conducting Commission business.

B. Disclosure of Contacts – Individual members of the Commission may, but are not required to, participate in or initiate discussions with interested parties affected by issues under consideration by the Commission. Such meetings or contacts with citizens should be disclosed at the next scheduled meeting of the Commission. The intent of such disclosures in a public setting is to preserve the integrity of the Commission’s process and provide a record and notice to other individuals who may also be affected or interested. If a Commissioner receives a request to meet/discuss but prefers not to do so, he/she may suggest the requesting parties to express their comments and concerns through the normal procedures, i.e., providing testimony at public hearings and/or providing comments to staff.

C. Contact Information – The contact information of members of the Commission should be considered public information and made available for public access upon request.

D. Conferences – Members of the Commission may attend, at their own expense, conferences, meetings and training courses closely related to Commission business.

VIII. Rules and Regulations Amendments

The Rules and Regulations may be amended by the Commission by a majority of vote at any meeting.