ROOM OCCUPANCY LIMITS – GUIDANCE FOR COVID-19 PREVENTION

March 22, 2021

The University of Washington Environmental Health & Safety Department (EH&S) provides the following guidance for determining room occupancy limits for use by University units to support COVID-19 prevention efforts in UW owned and leased facilities. This document addresses the various occupancy limit restrictions established by Washington state in the Washington COVID-19 reopening guidance and Labor & Industries DOSH Directive 1.70. This guidance does not apply to UW Medicine locations and medical or patient care facilities.

BACKGROUND & RISK REDUCTION

The more common mode of COVID-19 transmission occurs from mucous membrane exposure to respiratory droplets during close contact with an infected individual. According to the Centers for Disease Control and Prevention (CDC), some infections can be spread by exposure to virus in small droplets and particles in the air. The virus may be able to infect people who are farther than six feet away from the person who is infected, or after an infected person has left the space.

To effectively minimize COVID-19 risk, it is important to implement multi-layered strategies. In order of effectiveness, workplaces should focus on eliminating the hazard by keeping people with symptoms from entering the workplace, maintaining a physical distance of six feet between people, using engineering controls (e.g., exhaust ventilation), administrative controls (e.g., staggered break times), and enforcing face covering requirements. It is necessary for workplaces to use these types of interventions together, along with encouraging good hygiene and frequent handwashing.

All strategies must be customized for the work environment and should include methods that address multiple modes of transmission.

COVID-19 PREVENTION MEASURES AND BUILDING CODE REQUIREMENTS

University facilities must be accessible, clean and sanitary for any intended use, and must follow the requirements in the local building codes. COVID-19 prevention measures that must be followed in all University facilities include:

- Physical distancing of 6 feet or more between individuals is maintained at all times.
- Reduced occupancy limits for indoor spaces aligned with current regulatory requirements.
- Face coverings are worn at all times indoors, except where exceptions are allowed in the University’s COVID-19 Face Covering Policy.
- Additional measures are described in the University COVID-19 Prevention Plan.

University facilities and maintenance personnel are responsible for the following COVID-19 prevention measures:
• Ventilation is provided and maintained in accordance with the [UW Facilities building readiness guidelines](#).
• Daily cleaning and disinfection of rooms occurs following the University’s [COVID-19 Enhanced Cleaning and Disinfection Protocol](#).
• Maximum occupancy limits are posted outside conference rooms and assembly areas.

### ROOM OCCUPANCY LIMIT REQUIREMENTS
Reducing the occupancy limit of indoor spaces is necessary for maintaining distance between individuals, reducing probability of transmission, and meeting reduced occupancy density limits required by the University and the state of Washington.

There are two methods that can be used to calculate the occupancy density:

**Method A: Percent Occupancy**

[Washington state COVID-19 reopening guidance](#) for specific establishments requires occupancy limits to be reduced by calculating a fraction of the maximum occupancy allowed by the local building code (used for calculating egress). The local building code references occupancy load factors that are used to determine maximum occupancy limits for a specific room based on the use for the purposes of this guidance. Secondly, DOSH Directive 1.70 has established an occupancy percentage for workplace meetings and trainings. The actual reduced occupancy density limit will depend on the net or usable area of the room, including the layout of the room and arrangement of tables, desks, chairs and equipment to allow for at least six-feet of distance between individuals.

**Method B: Usable square footage per person**

Where specific requirements for reducing the occupancy by a percentage does not exist, occupancy will be reduced based on usable square footage per person. The amount of square feet per person will be the [greater](#) of the three criteria below:

1) Occupancy load factor for a specific use allowed by the building code. Where the occupancy load factor is greater than 40 square foot per person, the occupancy load factor shall take precedence.

2) If the occupancy load factor is less than 40 square feet per person, 40 square feet per person shall take precedence. Forty square feet per person was established by meeting the six-foot distance requirement, accounting for the additional average measurement of a person's body width$^1$.

3) Square footage per person requirement established by [Washington state COVID-19 reopening guidance](#) for a specific type of space or activity.

Refer to Table 1 on the following page for current Washington state room occupancy limits depending on the type of space and activity performed in the space.
### Table 1: Washington state room occupancy limits

<table>
<thead>
<tr>
<th>In this type of space or while doing this activity ...</th>
<th>... reduced room occupancy is a percentage of room occupancy OR square feet per person ...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent occupancy</td>
</tr>
<tr>
<td></td>
<td>Usable square feet per person</td>
</tr>
<tr>
<td></td>
<td>whichever results in a smaller occupancy limit</td>
</tr>
<tr>
<td><strong>Academic / classroom instructional spaces</strong></td>
<td>50%</td>
</tr>
<tr>
<td><strong>Research and teaching laboratories and shops</strong></td>
<td>50%</td>
</tr>
<tr>
<td><strong>Eating and drinking areas</strong></td>
<td>50%</td>
</tr>
<tr>
<td><strong>Dancing, singing, yelling, playing woodwind and brass instruments</strong></td>
<td>50%</td>
</tr>
<tr>
<td><strong>Study and collaboration areas</strong></td>
<td>50%</td>
</tr>
<tr>
<td><strong>Work-related meetings and trainings</strong></td>
<td>50%</td>
</tr>
<tr>
<td>Lobbies, corridors, hallways, stairways, elevator lobbies, and common areas</td>
<td>50%</td>
</tr>
</tbody>
</table>
| Elevator cars (see Appendix)                         | not applicable                                                                    | Six-foot separation
| Restrooms (see restroom guidance)                    | not applicable                                                                    | not applicable |
| Data centers                                         | 50%                                                                                | 40'iii                                                               |
| Mechanical spaces                                    | 50%                                                                                | 40'iii                                                               |
| **Gyms and fitness centers**                         | 50%                                                                                | 50'(gross)                                                          |
| Libraries                                            | 50%                                                                                | 50'                                                                 |
| **Museums and art galleries**                        | 50%                                                                                | 40'                                                                 |
| **Retail shops**                                     | 50%                                                                                | 40'                                                                 |
| **Miscellaneous indoor /outdoor venues**            | 50%                                                                                | 40'                                                                 |

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1. UW limit of maximum occupants in any academic gathering is 50 regardless of the size of the space. Academic classrooms have established occupancy limits based on the building code occupancy load factor, six-foot distancing and net usable area.

2. The University requirement of 40 square feet per person applies in all facilities that do not have a room capacity reduction requirement as specified in the Washington state COVID-19 reopening guidance or an occupancy load factor specified in the local building code.

3. Evaluate ventilation systems; if an enclosed space is poorly ventilated, determine whether occupancy numbers must be reduced and/or identify additional controls.

4. Elevators are limited to the number of people that can be separated by six-feet (see the Appendix).

5. Occupancy load factor based on the building code maximum floor area allowable for an occupant for a specific occupancy type and must be used in place of the minimum 40 square foot per person measurement if greater. Use gross square feet of space to calculate the number of occupants if indicated in the table.
DETERMINE REDUCED ROOM OCCUPANCY

Gather the following information to determine the reduced room occupancy:

1. **Type of room and/or activity** that will occur in the space (if known)
   - If a space falls into two categories, select the category with values from the table that result in a smaller occupancy limit or largest square footage per person, whichever is the more restrictive requirement.
   - Note the percent occupancy and square feet per person values from the table for the selected category.

2. **Existing room occupancy**
   Conference rooms and assembly areas typically have signage indicating occupancy limit under normal conditions, or contact the building coordinator. If the occupancy limit is not posted or if the room occupancy is unknown, contact the building coordinator or EH&S for assistance.

3. **Total square footage of the room**
   Square footage can be accessed through Invision Space Viewer, or contact the building coordinator.

4. **Physically confirm the layout and orientation of the space** and how it will be used to ensure that a min of 6 feet between people can be maintained at all times. Subtract unusable area from gross square footage to determine usable square footage.

After you have collected the above information, determine the reduced room occupancy by completing the following steps.

<table>
<thead>
<tr>
<th>STEP 1</th>
<th>STEP 2</th>
<th>STEP 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calculate the room occupancy using a percentage in Table 1</strong>*:</td>
<td><strong>Calculate the room occupancy using square footage in Table 1</strong>*:</td>
<td>Select the smaller room occupancy value.</td>
</tr>
<tr>
<td>[Existing room occupancy based on occupancy load factor or posted limits] \times [Percent occupancy from table] = <strong>Room Occupancy A</strong></td>
<td>[Total square feet of room] \div [Square feet per person from table] = <strong>Room Occupancy B</strong></td>
<td>Compare Room Occupancy A to Room Occupancy B. The smaller number (A or B) is the total number of people allowed in a room at reduced occupancy.</td>
</tr>
</tbody>
</table>

* Usable area or net = gross square feet minus fixed structures, equipment and furnishings.
Final Step: Verification

Conduct a site visit and verify that the number of people calculated using Method A or Method B can be physically separated from one another by a minimum of six feet, when seated and when passing by another person.

EXAMPLE 1: RESEARCH OR ACADEMIC LABORATORY

STEP 1: Not applicable to teaching and research laboratories

STEP 2: Calculate the room occupancy using square footage

Square footage of lab space = 588 (gross, source: InVision Space Viewer)
Usable space = 40% taken up by fixed and portable equipment = 352 remains

352 remaining sq. ft / 50 sq. ft per person (from Table 1) = 7 persons

STEP 3: Not applicable

Recommendations

- Stagger people at benches so that they are not directly across from each other
- Allow for six-foot separation while at fume hood and lab sink
- The maximum number may need to be reduced to allow for movement in the lab.
EXAMPLE 2: WORKPLACE MEETING

STEP 1: Calculate the room occupancy using a percentage

- Conference Room with Maximum Occupancy posted = 30 persons
- Percent occupancy limit for work-related meetings and trainings (from Table 1) = 50%
- 30 persons x 0.5 = **15 persons** (Room Occupancy A)

STEP 2: Calculate the room occupancy using square footage

- Square footage of conference room = 417 square feet gross
- Net square feet due to projections/fixed equipment = 375.3 square feet
- Square feet per person for work-related meetings and trainings (from Table 1) = 40 sq. ft.
- 375.3 sq. ft. / **40 sq. ft. per person** (from Table 1) = **9.3 persons** (Room Occupancy B)

STEP 3: Compare Room Occupancy A (15 persons) to Room Occupancy B (9.3 persons).

Choose the smaller number (Room Occupancy B) and round down to the nearest whole number (**9 persons**).
ADDITIONAL RESTRICTIONS

In addition to reducing room occupancy, there may be additional restrictions applied to a space for COVID-19 prevention that may include time limits for specific activities, such as eating and drinking. Contact EH&S at ehsdept@uw.edu for additional guidance.

RESOURCES

<table>
<thead>
<tr>
<th></th>
<th>UW EH&amp;S COVID-19 Health &amp; Safety Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Novel coronavirus &amp; COVID-19: facts and resources</td>
</tr>
<tr>
<td>1 Kodak's Ergonomic Design for People at Work, 2nd Ed. Table 1.5, pp 48 - 49.</td>
<td></td>
</tr>
<tr>
<td>City of Seattle</td>
<td>2015 Seattle Building Code</td>
</tr>
<tr>
<td>City of Bothell</td>
<td>2015 Bothell Building Code</td>
</tr>
<tr>
<td>City of Tacoma</td>
<td>2018 Tacoma Building Code</td>
</tr>
<tr>
<td>State of Washington</td>
<td>State of Washington Safe Start Requirements:</td>
</tr>
<tr>
<td></td>
<td>COVID-19 Reopening Guidance for Businesses and Workers</td>
</tr>
</tbody>
</table>
APPENDIX – ELEVATOR CAR MEASURING TEMPLATE

Measurement Methodology:

One of the key elements to prevent the transmission of SARS-CoV-2 include physical distancing. Six feet is the distance that individuals should remain apart while on campus, including when occupying elevators when possible. One transmission route of SARS-CoV-2 is through respiratory droplets emitted from the mouth and nose. OSHA defines the personal breathing zone as “a hemisphere forward of the shoulders within a radius of approximately six to nine inches.”

Because the breathing zone is a hemisphere forward of the shoulders it is important to align the breathing zone with the average shoulder width of the adult population. Considering the average shoulder width helps to align the floor marking in the elevator such that there is enough room for a person to stand near the designated corner of the elevator comfortably and without touching the walls or handrails. The average shoulder breadth measurement of adults is referenced from Ergonomic Design for People at Work, Volume 1 (Table VIA-2, pp 290-293), and is 16.6 inches.

A floor marking placement template was constructed using the OSHA defined breathing zone (radius of 9 inches as conservative size), the average shoulder width of adults, and the floor marking dimensions. This template is meant to be placed on the floor to determine the best position to adhere to the six-foot physical distancing guideline. Please see Figure 1 below for template details.

![Floor marking placement template for elevator physical distance measurements](image)

Figure 1 – Floor marking placement template for elevator physical distance measurements

The following steps outline the measurement process using the template file. Contact EH&S for the template.
1. Print template to scale to retain exact dimensions

2. Cut away shaded area. Cutting around the purple floor marking section helps to align a floor marking sticker on the elevator floor while the template is in ideal placement to ensure six-foot physical distancing.

3. Place template on the floor of the elevator in one corner, oriented towards the corner or one wall of the elevator. It is recommended that persons face toward the wall, away from others breathing zones.

4. Ensure the ends of the red shoulder plane indicator do not touch the sides of the elevator or would touch any projections such as handrails.

5. Tape down template to ensure no movement during measurement from one template to another.

6. Place a second floor marking placement template at the opposite corner of the elevator following steps 3-5.

7. Measure the distance from the closest point of the blue breathing zone lines of the templates.

8. If the distance is six feet (72 inches) or more between breathing zones then floor markings may be placed in the locations as determined by the template.

Figure 2 – Example of Floor Marker being placed in the elevator car

Floor Markings:

Floor markings acquired through the Creative Communications Safe and Clean Storefront are sized as 9” x 9” and may be affixed to the floors of the elevator to ensure proper placement of individuals at a distance of greater than six feet between breathing zones. It's recommended that these floor markings be placed in elevators in an orientation so that individuals face away from one another.