Seattle Building Tune-Ups Program
March 13, 2019

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What we will cover today

• Program Overview
• Building Tune-Up
• Alternative Compliance Pathways
• Tools + Resources
• How to Submit
• Q&A
What is the Seattle Building Tune-Ups Program?
What is a Seattle Building Tune-Up?

- Operational and maintenance improvements
- Typically generates 10-15% energy savings
- Best practice for managing an efficient building

10 to 15% Savings
Why is the City of Seattle Mandating Building Tune-Ups?
32% of Seattle’s Emissions from Buildings

Source: 2014 Seattle Community GHG Inventory
Seattle Annual Commercial Energy Use

Baseline: 26.8
Actual: 26.5
Goal: 16.2

CURRENT TRAJECTORY

7% DECREASE BY 2050

45% DECREASE BY 2050
Who Needs to Comply?

- All commercial buildings and spaces 50,000 sf or greater (excluding parking)
- Tune-Up required every five years
Leading by Example

The majority of City of Seattle-owned buildings must meet the Building Tune-Ups deadlines one year ahead of privately-owned buildings.

• Save tax payer dollars
• Reduce carbon
• Generate lessons learned
• Help improve implementation
Tune-Ups Compliance Process
READY TO GET STARTED?

Identify compliance year

DATE

Identify compliance year

PATHWAY

Find a Tune-Up Specialist

SPECIALIST

Decide to Tune-Up or pursue Alternative Compliance

TUNE-UP

Assess building and make Corrective Actions

REPORT

Report to the City

Seattle Building Tune-Ups
TUNE-UP SCHEDULE
Ongoing, every five years

<table>
<thead>
<tr>
<th>BUILDING SIZE*</th>
<th>ALTERNATIVE COMPLIANCE DUE DATE</th>
<th>TUNE-UP SUMMARY REPORT DUE DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>200,000+ SF</td>
<td>September 4, 2018</td>
<td>March 1, 2019</td>
</tr>
<tr>
<td>100,000-199,999 SF</td>
<td>April 1, 2019</td>
<td>October 1, 2019</td>
</tr>
<tr>
<td>70,000-99,999 SF</td>
<td>April 1, 2020</td>
<td>October 1, 2020</td>
</tr>
<tr>
<td>50,000-69,999 SF</td>
<td>April 1, 2021</td>
<td>October 1, 2021</td>
</tr>
</tbody>
</table>

* Excluding parking
Conduct a Building Tune-Up

Alternative Compliance – various pathways that represent Exemplary Performance or Tune-Up Equivalency*

Limited Extensions and Single-Round Waivers*

*If not conducting a Tune-Up, requests are due 180 days before compliance deadline.
Tune-Up Specialists must meet following qualifications

At least seven years experience *plus* one of the following:

- Professional Engineer PE in Washington state
- Building Operator Certification BOC Level II
- Certified Energy Manager CEM
- Certified Commissioning Professional CCP
- Commissioning Authority CxA
- Existing Building Commissioning Professional EBCP
- Bachelor in Sustainable Building Science Technology BAS
Conduct a Building Assessment
- of building systems to identify operational or maintenance deficiencies
- review benchmarking data and water bills

Identify Corrective Actions
- identify required and voluntary operational and maintenance improvements

Implement Required Corrective Actions
- address all Required Corrective Actions identified in the building assessment

Verify Changes
- confirm all corrected equipment and systems are functioning as intended
Report to City of Seattle

- Complete the online Building Tune-Up summary report
- Review with building owner
- Submit to the City for compliance review (more on this later)
# Seattle Building Tune-Up Enforcement

<table>
<thead>
<tr>
<th>BUILDING SIZE</th>
<th>1ST PENALTY</th>
<th>2ND PENALTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>200,000 sf</td>
<td>$5,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>100,000 - 199,999 sf</td>
<td>$2,500</td>
<td>$10,000</td>
</tr>
<tr>
<td>50,000 - 99,999 sf</td>
<td>$2,000</td>
<td>$8,000</td>
</tr>
</tbody>
</table>

*Excluding parking

Assessed 180 days after due date
Assessed 360 days after due date
Building Tune-Ups
Seattle Building Tune-Ups Major Focus Areas

1. Heating, Ventilation and Air-Conditioning Systems and Controls
2. Lighting System and Controls
3. Domestic Hot Water
4. Water Use
5. Building Envelope
## PNNL Summary of Meta-Data Results
(Large Buildings with Building Automation)

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Large Office</th>
<th>Large Hotel</th>
<th>Secondary School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wider Deadbands and Night Setbacks (G2)</td>
<td>10%</td>
<td>8%</td>
<td>12%</td>
</tr>
<tr>
<td>Shorten HVAC Schedules (G1)</td>
<td>14%</td>
<td>16%</td>
<td></td>
</tr>
<tr>
<td>Minimum VAV Terminal Box Damper Flow Reductions (G2, G9)</td>
<td>18%</td>
<td>0%</td>
<td>3%</td>
</tr>
<tr>
<td>Supply Air Temperature Reset (G3)</td>
<td>10%</td>
<td>11%</td>
<td>2%</td>
</tr>
<tr>
<td>Optimal Start (G4)</td>
<td>10%</td>
<td></td>
<td>14%</td>
</tr>
<tr>
<td>Static Pressure Reset (G3)</td>
<td>4%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Optimal Stop (G4)</td>
<td>3%</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Exhaust Fan Control (G5, G6)</td>
<td>1%</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Hot Water Temperature Reset (G3)</td>
<td>1%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Re-calibrate Faulty Sensors (G5)</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Chilled Water Temperature Reset (G3)</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Hot Water Differential Pressure Reset (G3)</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Chilled Water Differential Pressure Reset (G3)</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Required vs. Voluntary Corrective Actions

Not all of the tune-up Corrective Actions are required to be implemented.

- Corrective Actions highlighted in **GREEN** in the tune-up workbook are required to be completed for compliance.
Required vs. Voluntary Corrective Actions

- Corrective Actions highlighted in **YELLOW** in the workbook are voluntary recommendations and not required to be completed for compliance.
HVAC Assessment Elements

G1 Equipment scheduling*
G2 Review setpoints*
G3 Review reset schedules and setpoints*
G4 Review optimal start/stop if applicable *
G5 Sensor calibration (critical sensors) *
G6 Controls functional testing *
G7 Simultaneous heating and cooling *
G8 Air balance issues
G9 Excessive ventilation
G10 Multiple zone systems with “rogue” zones

G11 Maintenance conditions *
G12 Check filters and strainers *
G13 Filters & strainer maintenance practices
G14 Equipment condition *
G15 Equipment repair/replacement
G16 Missing or damaged duct or pipe insulation
G17 Check valves & dampers *
G18 Equipment at end of life

*implementation of Corrective Action is required
Lighting Assessment Elements

H1 Lighting levels
H2 Lighting control system sensors
H3 Lighting control schedules *
H4 Identify inefficient lighting equipment

*implementation of Corrective Action is required
Domestic Hot Water Assessment Elements

i1 Review DHW temperature setpoints *

i2 Review circulation pump controls*

*Implementation of Corrective Action is required
Water Usage Assessment Elements

J1 Verify Cooling tower conductivity meter is calibrated and functioning properly*
J2 Recommend repairs, as appropriate
J3 Evaluate cooling towers for water leaks and excess water consumption*
J4 Verify irrigation schedules for irrigated areas >500 ft²
J5 Verify irrigation rain sensors are calibrated, functioning properly, and located appropriately*
J6 Review water features schedule*

J7 Check irrigation system for leaks, overspray, broken heads, plugged nozzles or other operational problems*
J8 Recommend repair if scope of work is more than standard maintenance
J9 Check plumbing fixtures for leaks*
J10 Recommend repair if scope of work is more than standard maintenance
J11 Check hands free sensor-activated plumbing fixtures for proper operation
J12 Check water flow features

*implementation of Corrective Action is required
Envelope Assessment Elements

K1 Check for roof penetrations & damage to siding that allow for entry of air or water, or gaps in envelope (missing weather-stripping at doors & windows, dampers, top of elevator shaft, etc.)

K2 Visually inspect accessible ductwork and inquire of staff if damaged ductwork is present (such as disconnects and/or holes).

K3 Identify any uninsulated attic areas or areas where attic insulation has been disturbed.

For all building envelope assessment elements, recommend improvements if scope of work is more than standard maintenance.
Out of 52 submitted Building Tune-Ups from the 200,000+ SF buildings cohort that we’ve had a chance to look at, these are the most commonly found deficiencies for the Required Corrective Actions and Voluntary Corrective Actions.

<table>
<thead>
<tr>
<th>#</th>
<th>Assessment Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>G5</td>
<td>HVAC sensors calibrated/appropriately located</td>
</tr>
<tr>
<td>G17</td>
<td>Valves and Dampers</td>
</tr>
<tr>
<td>G6</td>
<td>HVAC sensors functioning as intended</td>
</tr>
<tr>
<td>G2</td>
<td>HVAC set points</td>
</tr>
<tr>
<td>G1</td>
<td>HVAC schedules</td>
</tr>
<tr>
<td>G8</td>
<td>Air balancing issues</td>
</tr>
<tr>
<td>G16</td>
<td>Duct and pipe insulation</td>
</tr>
<tr>
<td>H2</td>
<td>Lighting sensors</td>
</tr>
<tr>
<td>J12</td>
<td>Water flow fixtures</td>
</tr>
<tr>
<td>H4</td>
<td>Inefficient lighting</td>
</tr>
</tbody>
</table>

Common Deficiencies Observed
Alternative Compliance
Alternative Compliance Pathways

**High Performance**
- Certified ENERGY STAR Score
- LEED Gold or Platinum O&M
- Living Building, Petal, or Net Zero Energy
- Low Energy Consumption (<20 EUI)*

**Tune-Up Equivalency**
- Ongoing Commissioning (OCx)
- Completed Retro-commissioning (RCx)*
- Implemented ASHRAE Level 2 Audit Recs*
- Reduced EUI by 15%*
- New Construction or Substantial Alteration
- SCL Energy Analysis Assistance (EAA) – Whole Building

*These pathways require a Tune-Up Specialist*
Under Limited Circumstances

Single-Round Waiver
- Demolition
- Major Renovation
- Financial Distress

One Year Extension
- Change of Ownership
- High Vacancy Rate
- Existing Mechanical Improvements
- Demonstrated 15% EUI Reduction
Tools and Resources
Tools & Resources

• Program website [www.seattle.gov/buildingtuneups](http://www.seattle.gov/buildingtuneups)
  • Click on “Resources” page

• Technical Assistance Help Desk
  • [BuildingTuneUps@seattle.gov](mailto:BuildingTuneUps@seattle.gov)
  • 206-727-TUNE (8863)

• In-person help sessions at Seattle Municipal Tower
  • Tuesdays and Fridays from 11AM-1PM
  • Please email [BuildingTuneUps@seattle.gov](mailto:BuildingTuneUps@seattle.gov) to sign up

• Several newsletters available:
  • Building Tune-Ups/Energy Benchmarking news
  • Tune-Up Specialist
Tools & Resources

• Handouts
  • Building Tune-Ups Overview
  • Building Owner’s Guide
  • Frequently Asked Questions
  • Alternative Compliance pathways
  • Extensions & Waivers
  • Seattle Justice Center Case Study
  • Common Measures Case Study

• MS Excel Building Tune-Up Summary report

• OSE Director’s Rule 2016-01
How to Submit

• Through April 1, 2019 accepting Excel Building Tune-Up Summary report and PDF Alternative Compliance request forms (emailed to BuildingTuneUps@seattle.gov)
• After April 1, 2019, all submittals via the Seattle Services Portal
Like cars and bikes, all buildings need to be tuned regularly to keep them running as efficiently as possible.