



PORTLAND PARKS & RECREATION

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Urban Forestry Tree Planting Compliance Report

For permits issued in 2015

Urban Forestry Tree Planting Compliance Report for 2015 Permits October 2017

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Table of Contents

Executive Summary	4
Background	8
Methods	9
Right-of-Way Tree Removal and Replanting Permits	11
Private Tree Removal and Replanting Permits	14
Development Permits for New construction and Remodels	18
Composition of Trees Planted	22
Follow Up Survey with Properties out of Compliance	25
Analysis and Recommendations	27
Process Challenges and Opportunities	29
Recommendations	32
Appendix A: Methods	33

Executive Summary

PP&R Urban Forestry (UF) periodically studies compliance with City tree permit requirements. The purpose of these studies is to provide staff and other interested parties with estimated rates of compliance, identification of compliance challenges, development and implementation of mechanisms to improve future permit compliance, and documentation of compliance levels, issues and improvement efforts. These studies are also undertaken because city resources do not allow for routine individual permit compliance checks and enforcement of tree permit requirements.

This report provides the results of UF's study of permits requiring a tree to be planted in 2015. A minimum 10% sample of both non-development Tree Removal and Replanting Permits and permits requiring street tree planting as a result of a development project were inspected during the summer of 2016 by UF staff. Staff confirmed the presence or absence of required trees as well as compliance with standards for planting and placement where trees were present. Findings and recommendations are summarized below.

Key Findings

Non-Development Permits

- Right-of-Way Trees: Rates of compliance with planting requirements declined from 90% in 2011 to 82% in 2015, and are below the target level of 90%.
- Private Trees: Overall compliance with planting requirements dropped from 66% in 2011 to 52% in 2015.
- An estimated 1,336 trees were not planted as a result of non-compliance with 2015 non-development permits (Tree Removal and Replanting Permits).
- There was little difference in compliance rates between Tree Inspector and Tree Technician-issued Type A permits for private tree removals. While planting compliance rates are far below desired levels, the more limited interaction with UF staff that occurs in the Tree Technician-issued process does not have a significant effect on compliance rates.

Development Permits

- Compliance rates compared to 2011 levels decreased for new construction permits while increasing slightly for remodels. Rates in each category (63% for new construction, 51% for remodels) are well below the 90% target.
- Both new development and remodels experienced declines in the planting of appropriate species. The majority of trees out of compliance with standards were species not on approved lists.
- An estimated 407 trees were not planted as required in permitted development projects in 2015.

Staffing limitations

- Staffing limitations at each bureau involved in implementing requirements of Title 11 (PP&R and Development Services) are a barrier to improving compliance over the long-term. Currently, there are no regular follow up inspections of tree plantings required by development or non-development related permits outside of the ten-percent samples used in this yearly report, and no capacity to increase these inspections at either bureau.

Recommendations

The following is a list of recommended actions to improve planting compliance based on findings of the study. At the time of writing, some recommendations have already been implemented. An annual update to this study will determine the effect of these actions and provide guidance for future work to promote higher rates of planting compliance.

Completed

- Send notification of planting requirements to permittees of non-development Tree Removal and Replanting Permits issued in 2016, and to property owners who had a remodeling permit finalized in 2016. *Sent February 2017.*
- Update language in Tree Removal and Replanting Permits to clarify the responsibility of authorized representatives for replanting, which includes contractors who submit permits on a property owner's behalf. *Updated Spring 2017.*
- Update the letter of planting requirements to over-the-counter permit holders to include confirmation of planting to be mailed back to UF staff. *Updated Fall 2016.*

Short-term actions to be completed in 2017

- Develop outreach materials and other tools to highlight planting requirements in development and non-development situations, which may include door hangers, planting flags, and updated brochures. *In progress.*
- Review and revise permit letters to clarify planting requirements and include relevant information on purchasing, planting, and establishing young trees. *In progress.*
- Continue annual permit compliance monitoring program for 2016 permits. *In progress.*
- Update and streamline permitting processes in conjunction with transition to a new City online permitting system, expected in 2019. *In progress.*

Long-term actions and items for further study, given adequate resources

- Abandon redlining process and require applicants to include required trees on site plans in development.
- Conduct outreach to tree nurseries on desired stock sizes and species as part of the 5-year update to approved species lists.
- Develop list of recommended trees for private planting to encourage increased planting of large form and evergreen trees where appropriate.
- Explore ways to fund and conduct follow-up inspections of Tree Removal and Replanting Permits in non-development situations.
- Explore the best method for providing a planting site inspection prior to finaling of permits in development situations, including funding and bureau responsibility.

The tables below summarize compliance rates from each permit category:

Table 1: Compliance rates for tree plantings required as a condition of a Tree Removal and Replanting Permit

	2011 Compliance rate	2015 Compliance rate	Trend
Permit Type Tree Removal and Replanting Non Development	Required trees planted	Required trees planted	
Right-of-Way (ROW)			
A Permits	-	84%	
B Permits	-	76%	
<i>Overall</i>	90%	82%	<i>Down</i>
Private			
A Permits, Tech issued	-	50%	
A Permits, Inspector issued	-	52%	
B Permits, Inspector issued	-	60%	
<i>Overall</i>	66%	52%	<i>Down</i>

Table 2: Compliance rates for right-of-way tree plantings required as a condition of a development permit

	2011 Compliance rate	2015 Compliance rate	Trend
Permit Type Development	Required trees planted	Required trees planted	
New construction			
Residential	83%	59%	<i>Down</i>
Commercial	89%	75%	<i>Down</i>
<i>Overall</i>	84%	63%	<i>Down</i>
Remodels			
Residential standard permits	41%	52%	<i>Improved</i>
Residential over-the-counter	52%	40%	<i>Down</i>
Commercial standard permits	48%	52%	<i>Improved</i>
Commercial over-the-counter	39%	100%	<i>Improved</i>
<i>Overall</i>	47%	51%	<i>Improved</i>

Background

Portland City Code requires tree planting as a condition of tree removal and development permits in order to mitigate the effects of tree loss and ensure that the services of the urban forest are sustained over time. This report investigates whether trees were actually planted when required as a condition of a permit issued in 2015. The intent of this report is to communicate annual compliance rates and to assist staff in setting goals and making policy changes that help permit holders meet tree planting requirements.

Regulatory changes under Title 11

The only study of planting compliance prior to this report was conducted for permits issued in 2011. Results included in this report are compared to those findings where applicable. Prior to the adoption of a new tree code, Title 11, in January 2015, the removal of healthy non-nuisance trees on private property was regulated on approximately one-third of properties. Title 11 extended regulation to all private lots, and to dead, dying, or dangerous trees and those on the *Nuisance Plants List*. These changes had the effect of increasing the number of applications for private tree removals by approximately 350% over pre-Title 11 levels, leading to a greater number of trees permitted for removal, and a greater number of trees required to mitigate these removals. Title 11 did not significantly alter the number of trees required to be planted as a result of development, or for street trees in non-development situations.

Overall, this increase in the scale of regulation of private tree removals under Title 11 has made rates of planting compliance all the more informative; current compliance rates potentially give a more accurate portrayal of overall private property tree removal and replacement in the city. While less than 400 trees were estimated not to have been planted in 2011 as a result of non-compliance, this study finds that number has increased to over 1,700 trees not planted in 2015. The loss this represents in potential benefits to Portland's residents is significant, and will hinder efforts to meet tree canopy goals, as set by the *Urban Forest Management Plan* and *Climate Action Plan*.

Increasing planting compliance

A central premise of Title 11 is that trees are replaced as they are removed in non-development situations, and that tree planting is incorporated into development plans where appropriate. This report will assist staff in assessing the extent to which the code meets these objectives, and guide strategies to move rates closer to 100% compliance with planting requirements.

Strategies to increase planting compliance rates will vary depending upon permit type. For non-development related right-of-way plantings, relatively minor changes to current business practices are expected to be effective in raising compliance. Low rates of private tree planting compliance in non-development will ultimately require a variety of changes to business practices, outreach efforts, and a greater number of follow-up inspections by UF staff, (which is currently too limited to take on such additional work). Increasing planting compliance rates for development permits will require a much greater effort and will involve increased collaboration between PP&R and the Bureau of Development Services (BDS), along with funding to conduct site inspections and enforcement work.

Methods

A sample of all permits issued in 2015 was inspected for tree planting compliance, using a target of 10%, or 25 cases when a 10% sample would be less than 25 cases. Two permit types, commercial new construction and commercial remodel over-the-counter (OTC), have a sample size of less than 25 cases because there were fewer than 25 total cases where replacement trees were required as a condition of the permit. See Table 4 for a list of permit types reported on in this study.

A trained staff member first examined digital permit files for each case in the City's permitting database (TRACS) prior to conducting a site visit. Sites were then inspected for removal of permitted trees, where applicable, and planting of required trees.

In addition to recording the presence of required trees, all plantings were inspected to determine whether trees met planting standards for species, size at time of planting, location, and planting depth. For trees in the right-of-way (also referred to as "street trees"), standards also include selecting a species with the appropriate mature form for the planting site, meeting minimum distance requirements from trees and other infrastructure, and planting the required caliper size. For private trees, the species cannot be listed on the *Portland Plant List* of nuisance species, and must be the correct size at time of planting (minimum 1.5" caliper or 5' tall for conifers). See Appendix A for more detail on planting and location standards. Table 3, below, summarizes data collected for this study.

Where applicable, data is also reported from compliance checks conducted in 2011 in order to provide a comparison to 2015 findings. Due to changes associated with the implementation of Title 11 in 2015, a number of new types of information were collected in 2015 that were not collected in 2011. Tables note where no information was recorded on 2011 permits.

Table 3: Data collected

Item	Answer
Tree planted?	Yes/No
If no, was the old tree removed?	Yes/No
Tree genus and species	Genus and species
Is the species mature form appropriate for the site?	Yes/No
If no, why	Mature form too big Mature form too small Species not on approved list
Planting site size (feet)	To nearest 0.1 foot
Overhead wires present?	High voltage/other wires/no wires
Tree caliper size (inches)	To nearest 0.1 inch
If conifer, height to standard?	Yes/No
Does planting depth meet standards?	Yes/No
Does planting location meet standards?	Yes/No
If no, why	See Appendix A

Table 4: Permitting types reported in this study

Permit Type
Tree Removal and Replanting Permits, Non Development
Right-of-Way (ROW)
A Permits
B Permits
Private
A Permits, Tech issued
A Permits, Inspector issued
B Permits, Inspector issued
Development Reviews, Right-of-Way (ROW)
New construction
Residential
Commercial
Remodels
Residential standard permits
Residential over-the-counter
Commercial standard permits
Commercial over-the-counter

Right-of-Way Tree Removal and Replanting Permits

Permit Process

Tree Removal and Replanting Permits for trees in the public right-of-way are requested by the adjacent property owner through an application process. With the implementation of a new tree code, Title 11 Trees, beginning on January 1, 2015, the cost of this permit was reduced to \$25 from \$35. Under Title 11, permits granted fall under two categories, A or B. Type A Permits are granted if the tree is dead, dying, or dangerous, while Type B permits may be granted in cases where trees are healthy but inappropriate for their location or are negatively impacting other more valuable trees. In the absence of extraordinary circumstances, the removal of healthy, functioning street trees is not permitted; therefore B permits are relatively rare. Under a Type A permit, City code requires one-to-one tree replacement if adequate space for planting exists. Under some Type B permits, mitigation requirements may increase to inch for inch replacement.

Upon application receipt, a Tree Inspector inspects the tree and site, determines if removal can be granted, and marks the curb for replanting if required. If a sufficient mitigation plan was submitted with the application, the Tree Inspector then issues and mails the final permit. In cases where the mitigation plan provided is insufficient or incomplete, the Tree Inspector will notify the property owner of the decision with a letter of tentative approval which outlines replanting requirements. The property owner is given a list of approved street trees appropriate for the site and is instructed to select a tree from this list in order to receive the final permit. The Tree Inspector only issues and mails the final permit once the property owner contacts them with the selection of a replacement tree. If it is not planting season, planting may be deferred until the following planting season to ensure higher tree survival rates. If the tree does not meet the criteria for removal, a letter of denial will be sent to the property owner.

Where a property owner has been required to send an updated mitigation plan prior to permit issuance, and the property owner does not contact the Tree Inspector to inform them of their tree selection within 60 days of the permit decision, the permit request is considered expired. While permit decision letters mailed to applicants state that the Tree Inspector must be contacted before the permit is issued, there may be some confusion. In order to inform UF of potential gaps in public understanding of the permit process, expired as well as denied permits were inspected to monitor whether trees were removed without a permit having been issued.

Findings

The following tables summarize permitting and compliance data collected on required plantings associated with Tree Removal and Replanting Permits for right-of-way trees issued in 2015.

Table 5: ROW Tree Removal and Replanting Permits applied for in 2015

Permit decision	Cases		Trees applied for removal	Trees required to plant
Type A, planting required	675	79%	1,036	1,015
Type B, planting required	31	4%	68	70
Approved, no planting required	25	3%	33	0
Tentatively approved, permit expired	55	6%	61	53
Denied	67	8%	115	n/a
<i>Total</i>	<i>853</i>	<i>100%</i>	<i>1,313</i>	<i>1,138</i>

Table 6: Study sample – 2015 issued ROW Tree Removal and Replanting Permits

Permit decision	Cases studied and % of total cases		Trees applied for removal	Trees required to plant
Issued Permits				
Type A, planting required	68	10%	99	97
Type B, planting required	25	81%	59	55
No Permit issued				
Approved, permit expired	25	46%	29	27
Denied	25	37%	53	n/a

Table 7: Planting compliance – issued ROW Tree Removal and Replanting Permits

Permit decision	Required trees planted		Trend
	2011	2015	
Type A	n/a	84%	
Type B	n/a	76%	

Table 8: Unpermitted tree removals – expired and denied ROW Tree Removal and Replanting Permits

Permit decision	% of cases where trees were removed without permit		Trend
	2011	2015	
Tentatively approved, permit expired	76%	36%	Improved
Denied	0%	0%	No change

Table 9: Compliance with street tree planting standards for ROW Tree Removal and Replanting Permits

Planting standard	% of trees planted		
	2011	2015 Type A	2015 Type B
Tree species appropriate for planting strip	83%	87%	88%
<i>Tree species too small for planting strip</i>	9%	4%	2%
<i>Tree species too large for planting strip</i>	8%	3%	10%
<i>Tree species is not on approved list</i>	n/a	6%	0%
Tree caliper/height meets size standards	92%	90%	76%
Planting depth standards met	n/a	67%	76%
<i>Planting depth too high</i>	n/a	11%	12%
<i>Planting depth too low</i>	n/a	22%	12%
Location standards met	n/a	75%	67%

Summary of findings: Right-of-way Tree Removal and Replanting Permits

- Rates of compliance with planting requirements have declined from 2011 to 2015, and are below the target level of 90%
- Updates to the process for correspondence with permit applicants has reduced the number of cases in which trees were removed where tentative approvals expired before permits were issued. Rates of compliance with permit denials of street tree removals continue to show that unpermitted removal subsequent to permit denial is not an issue in the right-of-way.
- Rates of compliance with planting standards are generally good, but show some opportunities for improvement. Increased homeowner education on how to source and properly plant trees would likely increase compliance with planting standards.

Private Tree Removal and Replanting Permits

Permit Process

Prior to the adoption of Title 11 in 2015, Urban Forestry regulated the removal of certain healthy, non-nuisance private property trees on approximately one-third of the city's tax lots. Title 11 extended regulation to all city tax lots, requiring a permit for the removal of any tree 12" DBH (diameter at breast height) or greater, or 6" in some environmental zones and plan districts.

Like right-of-way Tree Removal and Replanting Permits, private property permits under Title 11 follow the Type A/B system. Type A permits are granted for dead, dying, dangerous, or nuisance species trees; trees within 10 feet of a building or attached structure; or for fewer than 5 healthy non-nuisance trees under 20" DBH in one year. Type B permits may be granted for healthy, non-nuisance species trees 20" or greater DBH, or for the removal of 5 or more healthy, non-nuisance species trees between 12" – 20" DBH. A Type B permit will only be granted in cases where a tree is inappropriate for its location or when a tree's structural development prevents continued healthy growth or is negatively impacting other more valuable trees. Trees removed under a Type A permit require tree-for-tree replacement, while trees removed under a Type B permit may require up to inch-for-inch replacement.

Upon application receipt, an Urban Forestry Tree Technician ("Tree Tech") will review the permit for completeness and, where sufficient evidence is provided (e.g. photographs showing that the tree is within 10 feet of a building, or under 20" DBH), will issue a Type A permit without site inspection. In cases where there is insufficient evidence to issue a Type A permit, or where the tree's size and species would require a Type B review, a Tree Inspector is assigned to visit the site to inspect the tree(s). If the tree does not meet the criteria for removal, a letter of denial will be sent to the property owner. Where trees meet removal criteria and the mitigation plan provided is sufficient, the Tree Inspector will then issue and mail the final permit. Where the mitigation plan provided is insufficient or incomplete, the Tree Inspector will mail a letter of tentative approval which outlines replanting requirements. As with right-of-way permits, the Tree Inspector only issues and mails the final permit once the property owner contacts them and informs them of the selection of a replacement tree. If it is not planting season, planting may be deferred until the following planting season to ensure higher tree survival rates. In cases where the property owner does not provide the necessary information within 60 days, the permit is expired.

The findings for compliance with private property replanting requirements are reported both by permit type and by which type of staff issued the permit. Due to staffing levels, the increase in permit volume following the extension of regulation to trees on all city tax lots under Title 11 required Urban Forestry to create a process where not all permits require site inspection. Allowing Tree Techs to issue some Type A private property permits has allowed Urban Forestry to keep up with permitting volume while continuing to issue permit decisions in a timely manner. Because Tree Tech-issued permits require less applicant interaction with UF staff and no onsite verification, monitoring compliance of these permits will provide necessary information as to whether this new process is working.

Inspecting private property lots for tree planting is challenging due to access, varying size of private lots, and existing vegetation. Due to these challenges, it was not always possible to determine if trees were removed or replanted. These are noted in the findings.

Findings

The following tables summarize permitting and compliance data collected on required plantings associated with Tree Removal and Replanting Permits for private trees issued in 2015.

Table 10: Private Tree Removal and Replanting Permits applied for in 2015

Permit decision	Cases		Trees applied for removal	Trees required to plant
Type A, Tech issued – planting required	1,037	51%	1,433	1,358
Type A, Inspector issued – planting required	663	33%	1,019	955
Type B, Inspector issued – planting required	32	2%	50	94
Approved, no planting required	165	8%	265	0
Tentatively approved, permit expired	22	1%	24	24
Denied	102	5%	127	n/a
<i>Total</i>	<i>2,021</i>	<i>100%</i>	<i>2,918</i>	<i>2,431</i>

Table 11: Study sample – 2015 issued private Tree Removal and Replanting Permits

Permit decision	Cases/ % of total		Trees applied for removal	Trees required to plant
Issued Permits				
Type A, Tech issued – planting required	104	10%	143	143
Type A, Inspector issued – planting required	66	10%	105	109
Type B, Inspector issued – planting required	25	78%	36	75
No Permit issued				
Tentatively approved, permit expired	22	100%	24	24
Denied	25	25%	33	n/a

Table 12: Planting compliance – issued private Tree Removal and Replanting Permits

Permit decision	Required trees were planted		Trend
	2011	2015	
Type A, Tech issued	n/a	50%	
Type A, Inspector issued	n/a	52%	
Type B, Inspector issued	n/a	60%	
<i>Total compliance rate*</i>	66%	52%	Down

* Because staff could not access all areas of each property, it could not be determined whether trees were planted in 14% of cases in 2011 and 11% of cases in 2015.

Table 13: Unpermitted tree removals – expired and denied private Tree Removal and Replanting Permits

Permit decision	% of cases where trees were removed without permit		Trend
	2011	2015	
Denied	23%	12%	Improved
Expired	40%	36%	Improved

Table 14: Compliance with planting standards for private Tree Removal and Replanting Permits

Planting standard	% of trees planted			
	2011	2015 Type A, Tech	2015 Type A, Inspector	2015 Type B
Tree species appropriate for site	n/a	97%	94%	97%
Tree caliper/height meets size standards	n/a	66%	70%	61%
Planting depth standards met*	n/a	85%	60%	90%
<i>Planting depth too high</i>	n/a	6%	6%	2%
<i>Planting depth too low</i>	n/a	5%	23%	3%

* Because staff could not access all properties beyond a visual inspection from a distance, the planting depth of between 5-11% of trees could not be determined.

Summary of findings: Private Tree Removal and Replanting Permits

- Overall compliance with planting requirements dropped from 66% in 2011 to 52% in 2015.
- Rates of unpermitted tree removals in association with expired and denied permits fell in 2015, demonstrating improvement in staff communication of regulations to applicants under Title 11.
- Only 61-70% of trees planted on private properties meet tree caliper size requirements at time of planting, a much lower rate than found in required street tree plantings (see Table 11).
- There was little difference in compliance rates between Inspector and Tech issued Type A permits. This finding suggests that while compliance rates are far below desired levels, the more limited interaction with UF staff that occurs in the Tech issued process does not have a significant effect on compliance rates.

Development Permits for New Construction and Remodels

Permit Process

During development, all new construction and remodeling projects with a valuation over \$25,000 require a street tree review. During a review, building plans, aerial photos, and/or sites are inspected by Urban Forestry staff and street trees are required to be planted in all available spaces or according to accepted street standards as a condition of the building permit. Planting requirements are stamped on approved building plans and appropriate approved street tree species lists attached. Development permits are divided into two categories: residential and commercial. The residential category includes single family residences and duplexes. The commercial category includes all other building types.

Remodeling permits are further divided by the process by which the permit was acquired. Permits are either issued through the standard process or the over-the-counter process, and which process an applicant goes through is determined by the Bureau of Development Services (BDS). The standard process requires the applicant to pass one or more building inspections prior to the permit being “finalized” or completed. Standard permits take longer to process and allow for a street tree review to occur before the permit is finalized. If trees are required to be planted, Urban Forestry staff will stamp requirements onto building plans, attach approved street tree species lists, and make comments on the digital permit file. Applicants are instructed to complete planting prior to the finalizing of the permit. Over-the-counter permits follow a much shorter process, as they can be purchased and finalized in one day without a building inspection. For over-the-counter permits, applicants are notified that street tree planting may be required as a condition of their permit, however street tree reviews may occur several weeks after the permit process is complete. If trees are required to be planted, the Tree Inspector sends the permit holder and property owner a letter with the number of trees required to be planted and an approved street tree species list.

After issuing planting requirements, Urban Forestry staff has no further role in ensuring that required trees are planted. All further inspections are conducted by BDS building inspectors, who final all development permits.

In approximately 10% of development permits, tree planting requirements are postponed until right-of-way improvements are completed by Portland Bureau of Transportation (PBOT). The number of properties that fall under this category is not currently tracked in the City’s permitting database, and are categorized instead as permits where tree planting was not required. Because some of these properties will eventually be required to plant trees, the actual percentage of cases where tree planting is required is likely higher than reported in Table 19 below.

Table 15: Development permits issued in 2015

Permit Type	Planting required (cases/% of total)		Planting not required (cases/% of total)	
	Cases	%	Cases	%
New Construction				
Residential	288	36%	523	64%
Commercial	12	8%	140	92%
<i>Total</i>	<i>300</i>	<i>31%</i>	<i>663</i>	<i>69%</i>
Remodels				
Residential standard	109	34%	210	66%
Commercial standard	47	13%	318	87%
Residential over-the-counter	44	5%	802	95%
Commercial over-the-counter	5	2%	323	98%
<i>Total</i>	<i>205</i>	<i>11%</i>	<i>1,653</i>	<i>89%</i>

Table 16: Sample size for 2015 development permits

Permit Type	Cases/% of total		Trees required
	Cases	%	Trees
New Construction			
Residential	29	10%	41
Commercial	12	100%	44
Remodels			
Residential standard	25	23%	51
Commercial standard	25	54%	84
Residential over-the-counter	25	57%	47
Commercial over-the-counter	5	100%	6

Table 17: Planting compliance – development permits

Permit Type	Required trees planted		Trend
	2011	2015	
New Construction			
Residential	83%	59%	Down
Commercial	89%	75%	Down
<i>Total compliance rate</i>	<i>84%</i>	<i>63%</i>	Down
Remodels			
Residential standard	41%	52%	Improved
Commercial standard	48%	52%	Improved
Residential over-the-counter	52%	40%	Down
Commercial over-the-counter	39%	100%	Improved
<i>Total compliance rate</i>	<i>47%</i>	<i>51%</i>	Improved

Table 18: Compliance with street tree planting standards for development permits

Planting standard	% of trees planted			
	Residential		Commercial	
	2011	2015	2011	2015
New Construction				
Tree species appropriate for planting strip	50%	31%	100%	61%
<i>Tree species too small for planting strip</i>	7%	8%	0%	0%
<i>Tree species too large for planting strip</i>	43%	23%	0%	22%
<i>Tree species is not on approved list</i>	n/a	38%	n/a	17%
Tree caliper/height meets size standards	93%	96%	83%	50%
Planting depth standards met	n/a	88%	n/a	67%
<i>Planting depth too high</i>	n/a	8%	n/a	33%
<i>Planting depth too low</i>	n/a	4%	n/a	0%
Location standards met	n/a	46%	n/a	61%
Remodels				
Tree species appropriate for planting strip	75%	45%	100%	79%
<i>Tree species too small for planting strip</i>	12%	11%	0%	1%
<i>Tree species too large for planting strip</i>	13%	19%	0%	3%
<i>Tree species is not on approved list</i>	n/a	25%	n/a	17%
Tree caliper/height meets size standards	80%	77%	83%	76%
Planting depth standards met	n/a	74%	n/a	82%
<i>Planting depth too high</i>	n/a	9%	n/a	10%
<i>Planting depth too low</i>	n/a	17%	n/a	8%
Location standards met	n/a	83%	n/a	90%

Summary of findings: Development permits

- Compliance rates decreased for new construction permits while increasing slightly for remodels. Rates in each category (63% for new construction, 51% for remodels) are well below the 90% target.
- Both new development and remodels experienced declines in planting of appropriate species. The majority of trees out of compliance with standards were species not on approved lists, which were updated in 2013.
- Only 46% - 61% of plantings for new construction permits met location guidelines.

Composition of Trees Planted

Species and genus of trees permitted were recorded during compliance site visits. Totals reported are for the sample only.

Table 19: Street tree types planted, non-development

2011		2015	
Genus	% of trees planted	Genus	% of trees planted
<i>Acer</i>	38%	<i>Zelkova</i>	9%
<i>Quercus</i>	6%	<i>Cornus</i>	7%
<i>Nyssa</i>	5%	<i>Lagerstroemia</i>	7%
<i>Prunus</i>	4%	<i>Prunus</i>	7%
<i>Zelkova</i>	4%	<i>Cercis</i>	6%
<i>Cornus</i>	3%	<i>Magnolia</i>	6%
<i>Magnolia</i>	3%	<i>Acer</i>	5%
<i>Parrotia</i>	3%	<i>Cercidiphyllum</i>	5%
<i>Fagus</i>	3%	<i>Fagus</i>	5%
<i>Gleditsia</i>	3%	<i>Quercus</i>	5%
<i>Stewartia</i>	3%	<i>Syringa</i>	5%
other	23%	other	34%

Table 20: Street tree types planted, development

2011		2015	
Genus	% of trees planted	Genus	% of trees planted
<i>Acer</i>	51%	<i>Fraxinus</i>	20%
<i>Pyrus</i>	15%	<i>Acer</i>	15%
<i>Prunus</i>	5%	<i>Carpinus</i>	14%
<i>Betula</i>	3%	<i>Magnolia</i>	8%
<i>Fraxinus</i>	3%	<i>Parrotia</i>	7%
<i>Malus</i>	3%	<i>Cornus</i>	6%
<i>Cornus</i>	2%	<i>Pyrus</i>	6%
<i>Crataegus</i>	2%	<i>Prunus</i>	5%
<i>Magnolia</i>	2%	<i>Cercis</i>	4%
<i>Quercus</i>	2%	<i>Styrax</i>	4%
other	13%	other	12%

Table 21: Private tree types planted, non-development

2011		2015	
Genus	% of trees planted	Genus	% of trees planted
<i>Fagus</i>	15%	<i>Acer</i>	15%
<i>Acer</i>	15%	<i>Cornus</i>	10%
<i>Styrax</i>	13%	<i>Prunus</i>	9%
<i>Prunus</i>	11%	<i>Malus</i>	7%
<i>Malus</i>	7%	<i>Thuja</i>	7%
<i>Cornus</i>	6%	<i>Pyrus</i>	6%
<i>Cedrus</i>	6%	<i>Cupressus</i>	4%
<i>Pinus</i>	4%	<i>Cercis</i>	3%
<i>Picea</i>	4%	<i>Chamaecyparis</i>	3%
<i>Ginkgo</i>	4%	<i>Pseudotsuga</i>	3%
<i>Alnus</i>	4%		
other	13%	other	30%

Table 22: Summary of functional type and mature size of trees planted, 2015

Permit Type	Functional Type			Mature Size		
	Broadleaf Deciduous	Evergreen Conifer	Broadleaf Evergreen	Small	Medium	Large
ROW, non-development	93%	4%	2%	41%	46%	13%
ROW, development	94%	1%	3%	30%	67%	3%
Private, non-development	72%	25%	2%	38%	43%	18%

**data on functional type and mature size of trees planted in 2011 was not reported*

Summary of findings: Composition of trees planted

- Ideally, no tree genus would represent more than 10% of trees planted in any given category, in order to reduce risk of loss to pest or disease. Currently, only non-development related street tree plantings meet this goal.
- Changes to the approved list of street trees in 2013 has resulted in a dramatic drop in the planting of maples (*Acer* genus), which are overrepresented in Portland's street tree population as a whole. Despite this being excluded from approved lists, maples are still the second most popular genus in development related street tree plantings.
- Of particular concern is the rise in planting of ash trees (*Fraxinus* genus) in development from 3% in 2011 to 20% in 2015. This tree is susceptible to the emerald ash borer, which has had a considerable impact on urban and natural forests east of the Rocky Mountains. While not currently found in Portland, efforts should be made to reduce the risk of loss to this pest in anticipation of its likely arrival.
- Despite the addition of more evergreen species to approved street tree planting lists in 2013, broadleaf deciduous trees make up greater than 90% of all street tree plantings.
- Large form trees are rarely planted in the right-of-way, at between 3-13% of plantings. On private land, where fewer constraints to the growth of larger trees exist, large form tree plantings were also rare, at fewer than 1 in 5 trees planted.
- While no list of approved species currently exists for private tree planting, efforts to educate property owners of the benefits of large-form and evergreen trees, which often are not appropriate in the more constricted spaces offered in rights-of-way, would increase the number of these valuable species.

Follow-up survey with properties out of compliance

To determine the most effective measures for program improvement, UF staff conducted a phone survey of properties where trees required from a Tree Removal and Replanting Permit (non-development) were not found and a valid phone number existed for the property owner. A total of 55 property owners responded to the survey, representing 68% of properties found to be out of compliance. In 14 cases, respondents claimed to have planted required trees(s), and these properties were re-inspected and study results updated, if necessary. In most of these cases, plantings were either too small to be noticed by UF staff, or not in locations marked on the submitted mitigation plan. A total of 41 respondents admitted to never having planted their required tree(s), and the tables below summarize responses from this group.

Tables 23 and 24: Survey responses, non-development permits out of compliance

Question	Response
<i>Did you or a contractor fill out the permit application?</i>	Homeowner: 41% Contractor: 46% Did not remember: 12%
<i>Are you aware that City code requires replacement plantings whenever a tree is permitted for removal?</i>	Yes: 71% No: 29%
<i>If you were aware of the City code requirements, why wasn't a tree planted?</i>	
Waiting for completion of another house project	31%
Did not want another tree on property	10%
Could not locate desired trees	17%
Forgot/could not decide where to plant	24%
Other reason	17%

Question	Response	
	Yes/Maybe	No
<i>What would have helped you to get your tree replanted within the permit timeframe?</i>		
A reminder notice to replant your tree	53%	47%
More information on proper planting and/or appropriate species to plant	34%	66%
More information on where to purchase an appropriate tree	19%	81%
The possibility of \$1000 fine	47%	53%

Summary of findings: Follow-up survey

- While 71% of respondents claimed to be familiar with the replanting requirement, of property owners who had a contractor fill out the permit, only 42% claimed familiarity. This points to an opportunity to work with the local arborist community to increase public understanding of Title 11 replanting requirements.
- Nearly one-third of respondents claimed to have conducted tree removal as one step of an unfinished house project. It is unknown how often non-development tree removal applications precede an application for development, but this finding could point to applicants using the non-development tree removal process to forgo preservation requirements in subsequent development projects. Further study is needed to answer this question.
- 10% of respondents openly admitted that they did not intend to plant a tree, despite understanding their permit requirements. In these cases, no amount of improvement to the permitting process would result in increased planting.
- Of proposed actions to help applicants meet tree planning requirements, the greatest number of respondents (53%) claimed that a reminder notice would be most helpful. This is encouraging, as it is one of the least costly options for Urban Forestry to pursue.

Analysis and Recommendations

This report documents compliance rates where tree planting is required by PP&R Urban Forestry. Findings reveal tree planting compliance varies greatly between permit types, however permitting volume in non-development is responsible for the majority of trees not planted due to non-compliance.

Table 25: 2015 tree planting compliance rates and estimated number of trees not planted

	2015 Total Cases	Compliance Rate	Estimated # cases out of compliance	Avg. # trees required per case	Estimated # trees not planted
Non Development					
ROW, Type A	675	84%	108	1.5	162
ROW, Type B	31	76%	7	2.3	16
Private, Type A, Tech issued	1,037	50%	519	1.3	675
Private, Type A, inspector issued	663	52%	318	1.4	445
Private, Type B	32	60%	13	2.9	38
<i>Total, non-development</i>	<i>2,438</i>		<i>965</i>		<i>1,336</i>
Development (ROW)					
New construction, residential	288	59%	118	1.4	165
New construction, commercial	12	75%	3	3.7	11
Remodels, residential standard	109	52%	52	2.0	104
Remodels, residential over-the-counter	44	40%	26	1.9	49
Remodels, commercial standard	47	52%	23	3.4	78
Remodels, commercial over-the-counter	5	100%	0	1.2	0
<i>Total, development</i>	<i>505</i>		<i>222</i>		<i>407</i>
Grand Total	2,943		1,187		1,743

This study estimates an overall compliance rate of 60% across all permit types, with 1,187 total permits out of compliance with planting requirements, totaling 1,743 trees not planted in 2015.

One hundred percent compliance with planting requirements, while desirable, would be unrealistic given current staffing constraints at both Urban Forestry and BDS. Therefore, a 90% compliance rate, which is presently met by only one permit type (over-the-counter commercial remodels), is Urban Forestry’s current goal. Table 29, below, shows the expected increase in number of trees planted in 2015 had planting met the 90% compliance rate.

Table 26: Increase in trees planted by raising compliance rates to 90%

	Trees planted at 2015 compliance rate	Trees planted at 90% rate	Increase in trees planted by raising rate
Non Development			
ROW, Type A	851	911	61
ROW, Type B	54	64	10
Private, Type A, Tech issued	674	1,213	539
Private, Type A, inspector issued	483	835	353
Private, Type B	56	84	28
<i>Total, non-development</i>	<i>2,117</i>	<i>3,108</i>	<i>991</i>
Development (ROW)			
New construction, residential	238	363	125
New construction, commercial	33	40	7
Remodels, residential standard	113	196	83
Remodels, residential over-the-counter	33	75	42
Remodels, commercial standard	83	144	61
Remodels, commercial over-the-counter	6	6	n/a
<i>Total, development</i>	<i>507</i>	<i>824</i>	<i>317</i>
Grand Total	2,624	3,932	1,308

Meeting the 90% compliance goal would have resulted in 1,308 more trees planted in 2015. Three-fourths of trees not planted resulted from non-development requirements, however the more than 300 trees not planted in development also represent a significant lost opportunity in environmental and other benefits provided to the city’s residents.

Process Challenges and Opportunities

While a variety of tools exist for increasing compliance, their consideration must take into account the relative benefits of, and constraints to, their adoption. Below is a summary of challenges, possible solutions, and opportunities for future improvement.

Non-development Tree Removal and Replanting Permits

- Enforcement actions available to UF include issuing a civil penalty of \$1,000 for each day the permit holder is out of compliance with requirements, initiating a proceeding before the Code Hearings Officer, or charging for the cost of tree planting through the nuisance abatement process. Currently, these tools are only used in cases where there is a public complaint concerning a suspected violation. While these actions would certainly increase planting compliance rates, the staff resources and administrative burden of pursuing them would be costly (nearly 1,000 cases are estimated to be out of compliance in 2015). A cost/benefit analysis is recommended before deciding to use enforcement as a primary tool for increasing compliance.
- Mailing notification of planting requirements to all non-development permittees is a relatively cost-effective option for reminding property owners of their permit obligations. This was also cited as the most helpful tool for increasing planting by respondents of the phone survey. As such, all 2016 Tree Removal and Replanting Permit holders were sent notification of their planting requirements by mail in February, 2017. Annual monitoring of permit compliance will measure the effectiveness of this action.
- Requiring proof of purchase of trees prior to permit issuance or requiring applicants to mail confirmation of planting to the Tree Inspector after permit issuance may improve planting compliance.
- Currently, there are not enough staff resources to conduct planting compliance inspections outside of the ten-percent samples used in this yearly report. Conducting follow-up inspections on the more than 2,000 Tree Removal and Replanting Permits issued in 2015 would have considerable cost in terms of staff time and program management. Additionally, nearly half of all permits are currently issued by Tree Techs, who do not carry out inspections in the field. Therefore, these would have to be allocated to Tree Inspectors, only increasing the burden on this limited number of staff. UF recommends exploring ways to fund and staff follow-up inspections on all required tree plantings if other actions fail to achieve desired compliance rates.
- Reducing any perceived barriers to planting is an important consideration for increasing compliance. Purchasing and planting trees as required may be viewed by permittees as burdensome extra steps after permit issuance. Including more information on tree planting and where to purchase trees with permit materials at issuance may help to increase planting compliance.
- Permit volumes under Title 11 have required a more streamlined process for applicants to receive permits in a timely manner. The main process change between 2011 and 2015 was

for some private Tree Removal and Replanting Permits to be issued by Tree Techs without field inspection. Rates of compliance between these and Tree Inspector issued permits are comparable, indicating that while compliance rates for private plantings are far below the program goal, requiring Tree Inspectors to visit every site (which would require funding new Tree Inspector positions to handle the increased workload) would not have an appreciable effect on planting compliance. UF will continue to monitor compliance rates of Tech and Inspector issued Tree Removal and Replanting Permits annually for any changes to findings presented in this report.

- Nearly 30% of permittees out of compliance with planting requirements claimed to not be aware that tree planting was a requirement of their Tree Removal and Replanting Permit. Many of these worked with a contractor to fill out and submit their permit, rather than read through and submit themselves. Increased use of outreach materials, better communication of responsibilities to the local arborist community, and an update of permitting letters to more clearly state requirements are all ways to address this issue.
- Over one-third of tentatively approved Tree Removal and Replanting Permits that expired due to lack of an adequate tree mitigation plan removed trees without an issued permit in 2015. A review of language used to communicate applicant requirements in these cases is necessary to reduce the number of unpermitted tree removals.

Development permits

- Unlike the non-development context, where UF is solely responsible for enforcement of planting requirements, street tree plantings required under development permits issued by BDS are enforced by that bureau. BDS currently does not inspect required street tree plantings or enforce UF planting requirements by either holding back approval of final inspections or holding back the certificate of occupancy.
- Current rates of compliance demonstrate a need to address tree planting. A revised approach that includes inspecting for tree planting during the building inspection process would be the most effective method for increasing planting compliance in development. Coordination between UF and BDS is needed to assess whether UF or BDS conduct inspections, and how best to minimize cost and delay to permittees.
- Outside of commercial over-the-counter permits (where only 5 permits required planting) compliance rates for remodels tend to be lower than with new construction. This may be due to some confusion on the part of permit applicants as to why their project would lead to a requirement to plant a street tree. Also, unlike in new development, building contractors may not pay attention to requirements outside of the envelope of construction. In February 2017, a planting reminder was sent to all property owners of permits finalized in 2016. Annual monitoring of permit compliance will measure the effectiveness of this action.
- Currently, the process for communicating planting requirements in all new development and standard remodel permits involves “redlining”, where UF staff draw required trees on submitted plans, attach a list of approved street trees for that site, and approve the permit to move forward. While this process causes no delay for the permit holder, low rates of

planting compliance and relatively high rates of trees planted in incorrect locations suggest that clearer communication of requirements may be necessary. Rather than redlining plans, UF staff could require applicants to include all trees on their site plans prior to approving the permit. It is expected that compliance rates would increase by requiring this step of applicants, however it could cause delays to the permitting process, affecting both applicants and other bureaus.

- A new online permitting system expected by BDS in 2018 will provide clearer lines of communication between UF staff and applicants, and will reduce confusion associated with redlining paper copies of plans. Plans for this new system will inform short-term actions taken to address planting compliance issues.

Recommendations

Below is a list of recommended actions to improve planting compliance based on report findings and considerations discussed on previous pages. These recommendations will be updated with each annual report, based on each year's findings.

Completed

- Send notification of planting requirements to permittees of non-development Tree Removal and Replanting Permits issued in 2016, and to property owners who had a remodeling permit finalized in 2016. *Sent February 2017.*
- Update language in Tree Removal and Replanting Permits to clarify the responsibility of authorized representatives for replanting, which includes contractors who submit permits on a property owner's behalf. *Updated Spring 2017.*
- Update the letter of planting requirements to over-the-counter permit holders to include a confirmation of planting to be mailed back to UF staff. *Updated Fall 2016.*

Short-term actions to be completed in 2017

- Develop outreach materials and other tools to highlight planting requirements in development and non-development situations, which may include door hangers, planting flags, and updated brochures. *In progress.*
- Review permitting letters to identify opportunities for clarifying planting requirements and including relevant information on purchasing, planting, and establishing young trees. *In progress.*
- Continue annual permit compliance monitoring program for 2016 permits. *In progress.*
- Update and streamline permitting processes in conjunction with transition to online permitting system, expected in 2018. *In progress.*

Long-term actions and items for further study, given adequate resources

- Abandon redlining process and require applicants to include required trees on site plans.
- Conduct outreach to tree nurseries on desired stock sizes and species as part of the 5-year update to approved species lists.
- Develop list of recommended trees for private planting to encourage increased planting of large form and evergreen trees where appropriate.
- Explore ways to fund and conduct follow-up inspections of Tree Removal and Replanting Permits in non-development situations.
- Explore the best method for providing a planting site inspection prior to finaling of permits in development situations, including funding and bureau responsibility.

Appendix A: Methods

Field inspections were conducted by trained Urban Forestry staff to assess whether required trees were planted and if appropriate standards were followed regarding planting, location, and species selection.

Planting standards were referenced from *PP&R Urban Forestry Street Tree Planting Standards*. The standards set by the City of Portland reflect industry standards and established best management practices for planting, as published in the American National Standards Institute's *ANSI A300 Part 6: Tree, Shrub, and Other Woody Plant Maintenance-Standard Practices (Planting and Transplanting)* (2012), the International Society of Arboriculture's *Best Management Practices: Tree Planting* (2005), and the American Nursery & Landscape Association's *American Standard for Nursery Stock* (ANSI Z60.1-2014). These standards require the root flare of the tree be level with existing soil grade. A 1" (+/-) tolerance was used for acceptable planting depth on all plantings.

Location standards were also referenced from *PP&R Urban Forestry Street Tree Planting Standards*. These standards outline specific distances that trees must be from different city infrastructure. Adequate spacing for trees is defined by at least 25' distance from adjacent trees in medium and large planting strips, and at least 18' distance for small strips. A 3' tolerance was allowed for both of these scenarios. Adequate spacing for trees from intersections and street lights is 25'; stop or yield signs 20'; fire hydrants and directional traffic signs 10'; driveways, alleys, utility poles and underground utilities 5'; and property lines 2'. A 1' tolerance was allowed for these location standards.

Right-of-Way Tree Removal and Replanting Permits

Staff first examined digital permit files for each ROW Tree Removal and Replanting Permits in TRACS to determine what tree species was removed and what species was permitted for replacement. Appropriate size standards were also assessed against Title 11 requirements for proper caliper size (minimum of 1.5" for one and two family residential, 2.0" for multi-dwelling residential, and 2.5" for all other development types), with a 0.25" tolerance for acceptability. Appropriate species was determined by inspector approved species (permitted) or by referencing City of Portland Approved Street Tree Planting Lists. A tree was determined not to be appropriate if caliper size was below requirements or the mature size did not match the appropriate planting strip width determined by the planting lists.

Development Permits

Development permits require street tree plantings depending on project size and scope and availability of planting space. UF staff examined permits and plan sites to determine where, and how many, street trees were required. All above standards for planting, location, and species were upheld for all development permits.

Private Tree Removal and Replanting Permits

Private Tree Removal and Replanting Permits and mitigation plans were examined for species removed and intended replacement species and location. Letters were sent out a week in advance to property owners informing them of the intent of UF staff to inspect replacement trees regarding planting and size standards (minimum of 1.5” caliper, with a 0.25” tolerance). Trees were inspected by a staff member when access was available; otherwise a visual assessment was done if the tree was visible from a distance. If a tree was not visible for inspection, a door hanger was left informing the property owner of inspection attempt with a date of return. If on the second visit there was still no response from the property owner regarding access to their property, it was classified as an “undetermined planting”. These cases were kept in the dataset and reported as such.

Table 27: Tree Location Standards

Existing infrastructure	Minimum distance	Tolerances
Intersections and street lights	25'	1'
Adjacent trees (large and medium sites)	25'	3'
Stop or yield signs	20'	1'
Existing trees (small sites)	18'	3'
Fire hydrants and directional traffic signs	10'	1'
Driveways, alleys, utility poles, and underground utilities	5'	1'
Property lines	2'	1'

Table 28: Tree Planting Standards

Tree Planting Standards		Tolerances
Depth	Bottom of root flare flush with grade	1" (+/-)
Caliper: (measured 6" above grade)		
One and two family residence ROW, private property	1.5"	0.25"
Multi-family dwelling residence ROW	2"	0.25"
All other dwellings ROW	2.5"	0.25"