Massachusetts Department of Conservation and Recreation

THE CITIZEN FORESTER

Urban & Community Forestry Program

WINTER 2024 | NO. 265

Mass Timber Construction

A New Vision for Urban Development

INSIDE THIS ISSUE:

Buildings and urban forestry go hand in hand. Think of any classic urban forestry image and chances are there's a tree in front of a building. The human desire for shelter began long ago, utilizing local resources to construct a vast array of dwellings. Villages became towns, towns became cities, and over time we developed our modern use of steel and concrete. Recently, there has been a new development called mass timber (short for massive timber) that is changing modern construction as we know it.

The new Computer Sciences Laboratories Building at UMass Amherst.

dcr Massachusetts

(Continued from page 1)

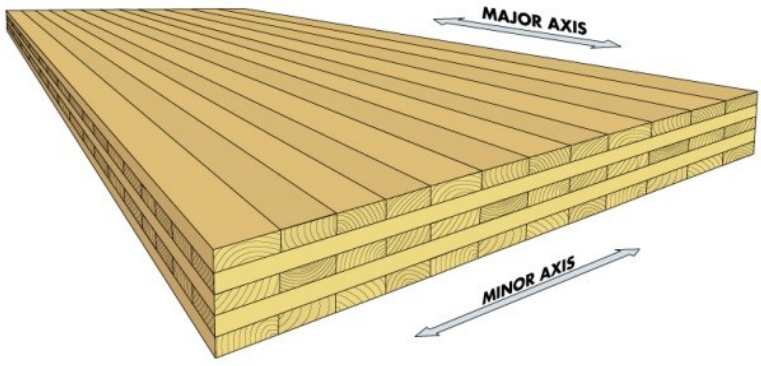
Mass timber is an umbrella term for a class of engineered wood building materials that are made by bonding and layering wood, in order to provide exceptional strength and stability. It is known as mass timber because it uses large pieces of wood, instead of smaller pieces of wood like lumber. The materials allow for building designs that are pioneering better places for us to live and work.

Mass timber construction uses one to two-inch boards layered and glued together into large, strong wood panels. It protects the environment by employing a material that uses less fossil fuel to produce and stores carbon rather than releasing it. Because of the panels' large size, mass timber is not usually used to build single-family houses.

Mass timber uses state-of-the-art technology to glue, nail or dowel wood products together in layers. The results are large structural panels, posts and beams which are exceptionally strong and versatile. If the primary load-bearing structure is made of either solid or engineered wood, it's considered a mass timber building. Mass timber products, like fabricated panels, columns and beams can complement light and heavy timber framing options. It's a strong, low-carbon alternative to concrete and steel.

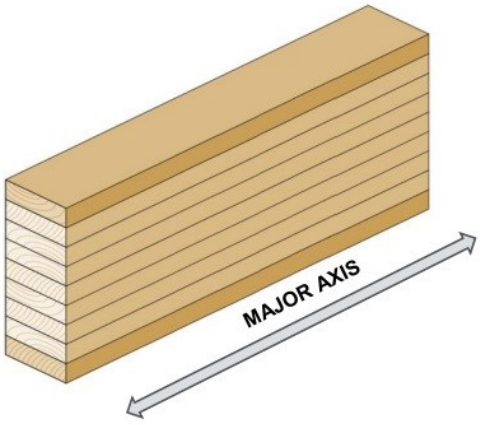
Typical mass timber products include cross-laminated timber (CLT), nail-laminated timber, glued-laminated timber (glulam), and structural composite lumber—all renewable and sustainable engineered wood products.

Cross Laminated Timber



Thick Orthotropic Plate

Glued Laminated Timber



Beam-like member

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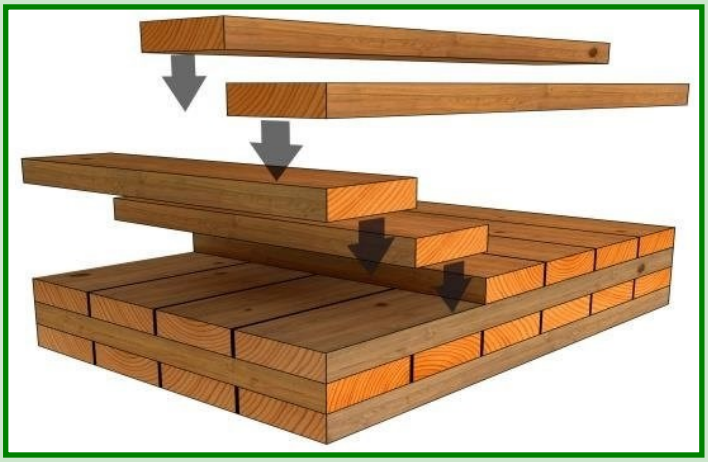
CLT is a wood panel system that is rapidly gaining in popularity in the U.S. after being widely adopted in Europe. The first CLT patent was in 1985 in France, and the first CLT projects were in 1993 in Germany and Switzerland. The material's strength, dimensional stability, and rigidity allow it to be used in mid- and high-rise construction. The first multi-story residential building was completed in 1998 in Austria.

CLT panels consist of layered lumber boards (usually three, five, or seven) stacked crosswise at 90-degree angles and glued into place. Finger joints and structural adhesive connect the boards. The panels can be manufactured at custom dimensions, though transportation restrictions dictate their length.



Alternating wood grains improve CLT panels' dimensional stability. This strength affords designers a host of new uses for wood, including wide prefabricated floor slabs, single-level walls, and taller floor plate heights. As with other mass timber products, CLT can be left exposed in building interiors, offering additional aesthetic attributes.

Like other mass timber products, CLT can be used in hybrid applications with materials such as concrete and steel. It can also be used as a prefabricated building component, accelerating construction timelines.

A great example of a mass timber building in Massachusetts is the John Olver Design Building on the campus of the University of Massachusetts at Amherst. The building was designed by renowned Boston-based Architecture firm Leers Weinzapfel Associates. Construction began in August 2015 and was completed in January 2017. The building consists of an exposed glulam frame (columns, beams, braces), CLT and concrete composite floors, and CLT shaft walls (for stairs, elevator, and mechanical

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shafts). It also features a three-story, folded, grand CLT staircase in the atrium. This building is the largest and most technologically advanced academic contemporary wood structure in the US. It is also the first in the US to use the wood-concrete composite floor system, which was developed by the UMass Amherst Building and Construction Technology Program.

The building has four floors on 87,500 gross square feet (GSF) which houses classrooms and studios, computer labs, lounges, meeting and teleconferencing rooms, a materials-testing lab, building science lab, wood shop, digital fabrication lab, an outdoor work area, offices for administration, faculty, staff and graduate students, as well as a cafe, exhibit space, a library, and event spaces. It also features a covered indoor common space on the first floor and an outdoor courtyard. The project cost of the Design Building was $52 million. Approximately 70,000 ft3 of wood was used in the creation of the Design Building, sequestering 2,000 tons of carbon dioxide (CO_2) from the atmosphere, which is now permanently stored in the building. This is equivalent to taking 500 cars off the road for one year. Besides the wood structure, this building's other sustainability features include: LED lighting, motion sensors, electro-tinting glass, heat-recovery systems, roof gardens, bioswales, rain gardens, and low-flow faucets.

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The success of the John Olver Design Building has led the University of Massachusetts to consider additional mass timber projects as they work towards a net zero carbon emission future. The University's current project is the Computer Science Laboratories (CSL) building located on the north side of Amherst campus and linked to the existing Computer Science Building. The 90,000-square-foot facility will bring together computer science students and faculty in classrooms, research labs, and community spaces designed to inspire creativity and collaboration in service of the common good. Designed by the architectural firm Perkins Eastman, the building is slated to open in the fall of 2025. With low-carbon mass timber construction, on-site solar array, and a planned connection to a nearby geothermal well field, the building will prioritize low energy use, minimize the use of fossil fuels, and serve as a model for the UMass Carbon Zero initiative.

Artist rendering of the completed Computer Science Laboratories building.

The highest-impact component of the transition to net-zero will be the large-scale conversion of the campus energy infrastructure. UMass plans to transition from fossil-fueled steam

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production to a modern, hot-water heating system paired with geothermal heating and cooling. The CSL building will incorporate these new technologies and serve as a model for other buildings as conversion takes place over time.

Per the Executive Order 594 signed by Governor Charlie Baker in 2021, all newly constructed state buildings over 20,000 GSF are required to be certified under the U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) rating system as LEED Silver or better. As an energy efficient and sustainable facility, the building will aim to exceed the minimum certification level of LEED Silver. The project will also incorporate a ground-source heat exchange system and incorporate the principles of a high-performance envelope. An energy exchange center (EEC) will be established by installing new heat pump equipment, a new underground low temperature hot water (LTHW) system, and a new geothermal vertical well field, established on the north side of Governor's drive.

As the project progresses over the next year, students, faculty and staff will use the opportunity to see the construction firsthand. “Any new system initially has some trepidation” says Project Manager Burt Ewart “but once you get used to it, mass timber offers a lot of flexibility and options. The contractors love working with wood. It’s a cleaner, quieter process than concrete and steel. The prefab design makes construction faster as well.” He says that projects are expanding in the area, with the new UMass School of Public Health & Health Sciences Building also including mass timber

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and a similar project at Williams College in Williamstown, MA. "It's not the way we've always done things" Ewart says. He's happy to talk with you if you are considering a mass timber project, and he can be emailed here.

Combining forward thinking construction practices within an academic setting can only benefit the future of mass timber. The students of today begin to expect energy efficient and sustainable facilities as the norm, not as the exception. As they leave universities and enter the workforce, they will bring these ideas and concepts with them, to assist in not only achieving a net zero carbon emissions campus, but a net zero carbon global community for the betterment of all.

References:

https://www.thinkwood.com/mass-timber

https://www.woodworks.org/learn/mass-timber-clt/

https://www.naturallywood.com/design-and-construction/mass-timber/

https://awc.org/issues/mass-timber/

https://www.umass.edu/bct/about-us/the-design-building-at-umass-amherst/

Photos:

DCR & University of Massachusetts

Forester Focus

A deeper look into today's Urban Forestry topics

Landscape Scale Restoration

Large grant program concludes in MA

The Landscape Scale Restoration (LSR) grant program is a US Forest Service (USFS) competitive grant that promotes collaborative, science-based restoration of priority forest landscapes and furthers priorities identified in State Forest Action Plans.

LSR projects cross multiple jurisdictions, including state and local government, and private land, to address large-scale issues. Projects are developed in partnership with diverse stakeholders and effectively leverage local knowledge, expertise, and resources which results in measurable on-the-ground impacts.

The project was developed with the idea of bringing the benefits of large-scale tree planting to smaller towns in central and western MA. The LSR program definition of rural land is an area outside of urbanized city or towns with a population greater then 50,000 inhabitants. The towns that were selected to participate in this project were originally Greenfield, Montague, and North Adams, with

DCR funded trees, planted by Opacum Land Trust in Southbridge, MA

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the later additions of Southbridge and Ware. The first three projects were coordinated by each town's Tree Committee and Franklin Land Trust. Southbridge was coordinated by Opacum Land Trust and Ware was coordinated by East Quabbin Land Trust.

The federal grant program pays up to 50% of the project costs and requires a 50% non-federal match, which in this case came from the Department of Conservation and Recreation in the form of trees.

Utilizing planting techniques and program materials previously developed through the Greening the Gateway Cities program, the grant partners were able to plant 4,000 new trees across the five communities. Program partners worked with federal, state and local governments as well as community groups and nonprofits to increase tree canopy along the public rights-of-way, in parks, at schools and in available yard space to provide public benefit to all members of the community.

LSR Grant Partners celebrate the project completion in Southbridge, MA

For more information, visit:

https://www.mass.gov/info-details/urban-and-community-forestry

Photos: DCR

CLIMATE RESILIENCY

DCR Awards More Than $400,000 to Seven Environmental Justice Communities to Expand Urban Tree Canopy

Boston – The Massachusetts Department of Conservation and Recreation (DCR) today announced the agency is awarding more than $426,000 to seven organizations to increase the urban tree canopy in environmental justice communities across the state. DCR is awarding the funding through the agency's Urban and Community Forestry Environmental Justice Grant Program. Increased tree canopy brings positive environmental, public health, and energy efficiency benefits to residents living and working in these communities.

"DCR is committed to increasing the urban tree canopy across the state to promote climate resilience and make our communities healthier places to live and work," said **DCR Commissioner Brian Arrigo**. "The Urban and Community Forestry Environmental Justice Grant program will add to our work through programs like Greening the Gateway Cities, that help improve the lives of residents and workers in some of our most vulnerable communities by mitigating the effects of climate change."

(Continued on page 11)

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The funding for the Urban and Community Forestry Environmental Justice Grant program is part of a $1.5 billion investment in the U.S. Department of Agriculture's Forest Service Urban and Community Forestry Program from President Biden's Inflation Reduction Act (IRA).

This funding will be used for tree planting and aftercare, tree and stump removal, community engagement and education, urban wood utilization, and workforce development. Overall, these projects will fund the planting and care of more than 500 trees in Waltham, Ludlow, Medford, Somerville, Boston, Oxford, South Hadley and Westborough. Increased tree canopy is proven to bolster resilience to extreme heat, storm-induced flooding, and other climate impacts. Overall, expanding the urban tree canopy positively impacts the lives of those living and working in a community by improving air quality, reducing energy use by keeping homes cool in the summer with shade and warm in the winter by breaking up wind, and providing habitat for local birds and wildlife.

Awardee:	Amount:
City of Waltham	$100,000
Hampden County Sheriff's Office (Ludlow)	$64,555
Mystic River Watershed Association (Medford & Somerville)	$46,984
Speak for the Trees (Boston)	$75,326
Town of Oxford	$23,760
Town of South Hadley	$23,626
Town of Westborough	$91,750

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"We are grateful for the funding of this project. Urban Foresters are charged with a monumental task as it relates to the care and planning of our future forests, this remarkable opportunity empowers Westborough to transform its canopy," said **Kyle Grendell, tree warden for the Town of Westborough.** "These trees will beautify the park, cool our corridor, and provide future generations a place of respite and joy as they help attain our climate action goals throughout the Town."

"The City of Waltham is grateful and excited to be a recipient of DCR's Environmental Justice Grant. We are thrilled that our needs align with the Commonwealth's goals. Our project "Replant Waltham" will see up to 140 new trees planted in an underserved neighborhood that is currently devoid of street trees," said **Kevin Thompson, tree warden for the City of Waltham**. "This is the first time, in my experience, that an entire neighborhood will be planted at once. We are truly appreciative of the U.S Department Agriculture's Forest Service Urban and Community Forestry Program, The Governor, and the Department of Conservation and Recreation."

(Continued on page 13)

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"Urban trees provide so many benefits to communities—from habitat for urban wildlife, to cooling our neighborhoods, to cleaning the air we breathe," said **Karina Ramos, Project Manager for Trees, Mystic River Watershed Association**. "MyRWA is excited to be working with so many municipalities to put more trees in the ground. We are very thankful for this support from DCR to help grow the urban canopy in Medford and Somerville"

"We're thrilled to be able to further our Tree Equity work in Boston through this Environmental Justice grant from DCR," said **David Meshoulam, executive director of Speak for the Trees, Boston.** "The planting of 50 trees will provide numerous benefits - such as reducing heat, absorbing air pollutants, and reducing stormwater runoff - in communities where it can make the biggest impact. And, by planting on the front and side yards of private properties, these benefits will extend into the public realm**."**

"The South Hadley Environmental Justice Tree Planting Program will plant 100 trees in the two South Hadley Environmental Justice Neighborhoods and provide educational opportunities to residents about tree identification, proper tree care, and how growing wild and native helps support a healthy community," said **Rebekah L. Cornell, planner and tree warden for the Town of South Hadley**.

For more information, visit:

https://www.mass.gov/news/dcr-awards-more-than-400000-to-seven-environmental-justice-communities-to-expand-urban-tree-canopy

Species Spotlight
Basswood, Tilia americana

In the world of urban and community forestry, we are probably more used to hearing about the littleleaf linden (*T. cordata*), the European cousin of American basswood, but this native has its place in the urban forest.

Basswood is a large tree, reaching heights of 60 to 80 feet, with a spread of 30 to 50 feet, though it can grow taller and wider. It is hardy in zones 3b to 8 and is native from Maine to Florida and west to the Dakotas and Texas. It is a tree of the central and eastern hardwoods, growing on mesic sites, often with sugar maple (Acer saccharum), red oak (Quercus rubra), white ash (Fraxinus americana), and others. The name basswood is thought to come from "bast wood," as the inner bark can be soaked and used to make fiber and rope.

Leaves are alternate, simple, and ovate to cordate, four to six inches long, with serrated margins and an acuminate tip and an uneven base. They are a shiny green above and are paler below. Basswood has a false terminal bud and lateral buds can be red-brown or greenish, are one-quarter to one-third-inch long, and two-scaled. Additionally, one side of the bud may bulge. The buds are roughly teardrop shaped.

Twigs are smooth, brownish-green to red in color, and usually zig-zag. Young bark is gray and smooth, but with age, it turns gray-brown and develops long ridges and furrows.

(Continued on page 15)

Species Spotlight—Continued

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Borne in hanging cymes, basswood flowers are perfect, fragrant, and creamy yellow. They bloom in late June or early July, attracting lots of bees. The flower stalks are attached to a long, flat bract, three to four inches long, which persists on the tree and can help aid in winter identification. In some areas, honey from basswood is collected.

The fruit is small, round, and nut-like, ripening in the fall and occurring in clusters. The seed provides food for birds and other wildlife. The strong, but soft, white, close-grained wood is a favorite of wood carvers. It is also used for lumber, the bodies of electric guitars, veneer, plywood, pulp, and other products.

Basswood is easy to transplant and can tolerate difficult soils and moderate drought conditions, though it is not very tolerant of air pollution or harsh urban conditions. While it is without serious pest or disease problems, basswood is susceptible to Japanese beetles, aphids, linden borers and other insects, as well as verticillium wilt and powdery mildew.

There are a few cultivars of American linden available, including ‘Redmond’ and ‘American Sentry,’ which are both smaller than the species. As a large tree, basswood requires a large site and could go in a park or other large area, or in a naturalized setting. Some of the smaller cultivars of basswood may be more suited to streetscapes, in areas where the tree could be planted out of the range of road salt, though this is a tree probably more suited to parks and other large open spaces.

Photos:

DCR, Virginia Tech & UConn Plant Database

Tour des Trees 2024

This September, DCR Urban & Community Forestry Program celebrated the 2024 Tour des Trees, in Fall River, MA.

The Tour des Trees is an annual long-distance cycling adventure which serves as the primary public outreach and community engagement event for Tree Research and Education Endowment Fund (TREE Fund). Since 1992, Tour des Trees riders have cycled through communities in the U.S., Canada and the U.K., planting trees, educating children and the public, and shining a light on the work done by arboriculture professionals and the importance of science-based tree care.

The ride was roughly 425 miles and had stops in Stamford, CT Middletown, CT Smithfield, RI Falmouth, MA Martha's Vineyard, MA and Providence, RI.

The Tour des Trees serves to advance TREE Fund's mission to explore and share the science of trees contributing to the lives of people, communities, economies, and the environment, and of the planning, planting, and sustainability of urban and community trees.

Trees are planted at various locations along the route and DCR partnered with the Tour to plant a tree at Lafayette Park on September 27th.

Photos:
Chris Bank

For more information, visit:
https://treefund.org/tourdestrees

Tree Stewards Training 2024

Newton— This fall, the DCR Urban & Community Forestry (U&CF) Program expanded the ever popular Tree Stewards Training Program into multiple locations, to double the number of registered attendees. Classes were held at the John Shea Technical Training Facility in Springfield in Western MA and UMass Mt. Ida Campus in Eastern MA.


Julie Coop

The trainings were similar in each location, with a full day's worth of speakers and hands-on learning opportunities.

Participants were introduced to the United States Forest Service (USFS) Urban Forestry Program by Danielle Gift and Ari Okun, who discussed the program and various funding sources that are currently available. DCR's Julie Coop followed up with information on the state's U&CF program, as well as resources for funding and education.


Rich Parasiliti

The Western class was treated to Rich Parasiliti, the Tree Warden from Northampton, who discussed Tree Boards and Ordinances / ByLaws for communities. Alex Sherman, the City Forester for Springfield gave a tour of the municipal tree nursery and answered questions about the set-up


Alex Sherman

and process involved in the nursery management.

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The Eastern class heard from Newton's Tree Warden, Marc Welch who presented on protecting and maintaining trees in the City of Newton.

He was followed by Tom Brady from Brookline on Tree Boards and Ordinances / ByLaws for communities.

Also presenting was Dave Bloniarz from the USFS who took the trainees on an insightful tour of the iTree programs, to estimate the value of the benefits that the trees in their communities provide.

The outdoor portions of the day included young tree pruning and training by Jen Kettell of Radiant Leaf Consulting, where future Stewards got hands on exposure to pruning young trees for structure.

Each class concluded with two tree planting demonstrations by DCR's Mathew Cahill.

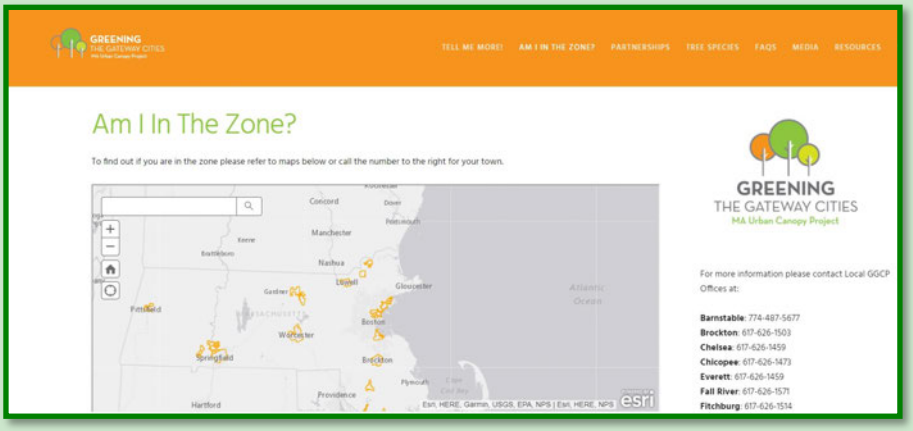
For more information, visit:

https://www.mass.gov/info-details/urban-and-community-forestry

dcr Massachusetts

Greening the Gateway Cities Program has a successful fall season!

The Greening the Gateway Cities Program (GGCP) continues to impress, as trees are delivered to residents most in need of canopy cover. Environmental Justice neighborhoods have requested huge numbers of trees in the expanded planting zones. Current lists and planting zone maps are available online, and urban foresters are scheduling site visits all winter long. Contact us today!



DCR Taunton crew plants trees at a new high density housing development as the construction phase wraps up.

More info at: https://www.mass.gov/service-details/greening-the-gateway-cities-program

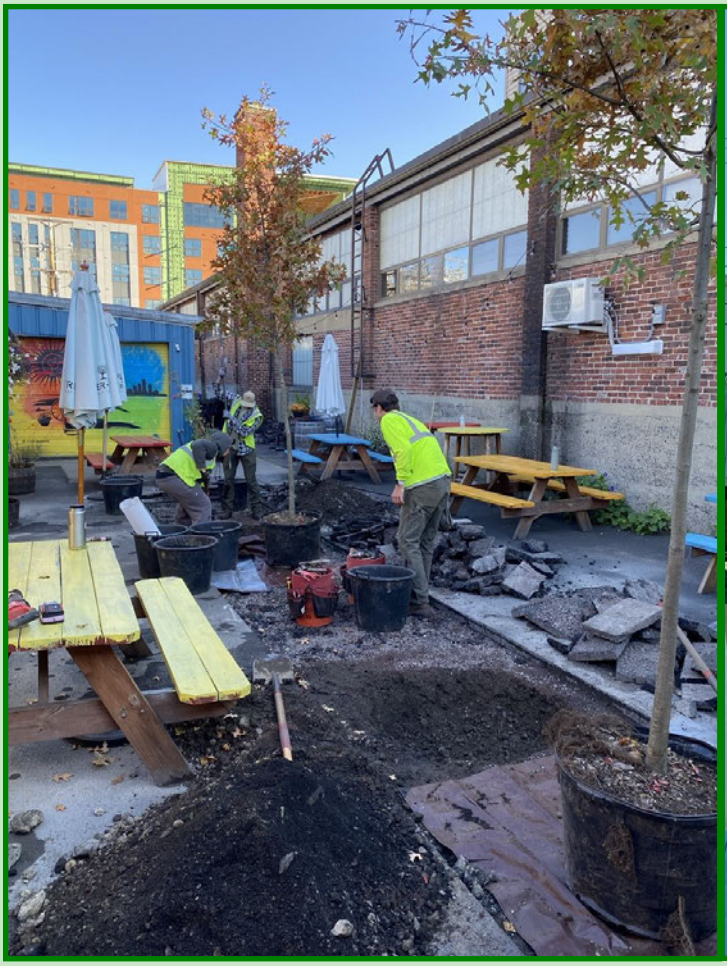
DCR Leominster crew plants trees at a local community center.

GREENING THE GATEWAY CITIES
MA Urban Canopy Project

DCR Holyoke follows the plan to improve a public park.




DCR Everett crew plants an industrial lot just outside of Rivergreen Park in Everett.
A trench 150'L x 7'W x 3'D was removed and replaced with soil, and DCR installed nine trees.




DCR Everett crew also plants trees at Short Path Distillery where more impervious surface was removed.

DCR Malden crew planting in yards and along the streets.

https://www.maurbancanopy.org/

Pocket Forest Planted in Malden

Malden — The City of Malden was proud to announce the installation of its first-ever pocket forest on Goodwin Avenue, an innovative urban green space aimed at increasing biodiversity and promoting sustainability. This project was made possible through an EEA grant sponsored by DCR's Urban and Community Forestry program.

Mayor Gary Christenson, State Representative Kate Lipper Garabedian, Ward 5 Councillor Ari Taylor, and Cemetery Director/Tree Warden Chris Rosa along with other elected officials celebrated the beautiful addition to Ward 5.

The idea originated from resident Ashley Kolodziej about a small piece of city owned land abutting her property who was looking for a way to beautify the area and bring neighbors together.

Residents Ashley Kolodziej, Jessica Fujimora and Lauren Albert also assisted in the efforts which included Councillor Taylor's facilitating multiple community meetings over several months and working with Tree Warden Chris Rosa to bring this project to life. The pocket forest is part of Malden's broader effort to expand green spaces, improve urban sustainability, and engage residents in environmental stewardship.

Before flexi-pave installation (left) and after installation with water capture demonstration (right). *Photos: DCR*

New and Stories from the Northeast Region

The Forest Service Urban & Community Forestry Program provides *Urban Tree News in the Northeast,* a collection of articles published in the media that have relevance to urban forestry in the Northeast.

Taking a look at Tree Eastie's Plans for the Fall and Beyond
USDA Forest Service Invests $265 Million to Conserve Private Forestlands
What's So Important About Preserving Big Urban Trees?
How urban forests will keep Boston cool - and more healthy
Bike marathon supporting the trees
'Linear urban forest' project aims to mitigate heat, improve health in cities
A green giant: This year's 74-foot Rockefeller Center Christmas tree is en route from Massachusetts
Governor Healey Joins Fire Officials in Urging Outdoor Fire Safety

On The Horizon

December 5	**Webinar:** Urban Forestry Today — Understanding & Optimizing Runoff Reduction with Urban Trees 12pm EST http://www.urbanforestrytoday.org/
December 10	**Webinar:** Deadly Oak Diseases— EPA Integrated Pest Management 2:00pm EST. https://www.epa.gov/ipm/upcoming-integrated-pest-management-webinars
December 11	**Webinar:** Urban Forest Connections — Centering Environmental Justice in Urban Forestry 1:00pm EST. https://www.fs.usda.gov/research/products/multimedia/webinars/urbanforestconnections
December 17	**Webinar:** TREE Fund webinars bring you the latest in tree research, directly from the scientists themselves. https://treefund.org/webinars
January 7-8	**Conference:** MTWFA Annual Conference. More info: https://www.masstreewardens.org/annual-conference/
January 21-23	**Event:** Tree Risk Assessment Qualification Courses Worcester, MA. More info: https://newenglandisa.org/
UCFS URBAN & COMMUNITY FORESTRY SOCIETY	**Newsletter:** City Trees — a free bimonthly publication for anyone interested in urban and community forestry at any level. https://ucfsociety.org/city-trees/
THIS OLD TREE PODCAST	**Podcast:** This Old Tree — *Heritage trees and the human stories behind them*. Old trees are awe inspiring links to the past that fire our historical imagination. https://www.thisoldtree.show/

Tree Tip:

Leave the Leaves!

Although raking leaves seems synonymous with autumn, allowing some leaves to remain in your yard can provide benefits for plants and local wildlife. When they decompose, leaves return nutrients to the soil. In addition, fallen leaves provide cover and insulation to overwintering insects including many types of moths and butterflies.

https://www.mass.gov/news/wildlife-friendly-fall-clean-up-tips

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Department of Conservation and Recreation – Bureau of Forestry
10 Park Plaza, Suite 6620
Boston, MA 02116

Julie Coop, Urban and Community Forester
julie.coop@mass.gov | (617) 626-1468

Mathew Cahill, Community Action Forester
mathew.cahill@mass.gov | (617) 626-1464

www.mass.gov/dcr/urban-and-community-forestry

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