CITY FOREST CREDITS

# Tree Preservation Protocol – 40 Years

Version 14.40 | August 10, 2026

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# Abbreviations, Acronyms, and Glossary

| | |
|---|---|
| Carbon (C) | A chemical element |
| Carbon Dioxide ($CO_2$) | One carbon atom and two oxygen atoms |
| Carbon Dioxide Equivalent ($CO_2e$) | Unit for comparing the radiative forcing of a GHG to carbon dioxide |
| Credit | A unit representing one metric ton of $CO_2e$ |
| Credit Commencement Date | The date from which credit issuance is calculated per specific Protocol requirements |
| Diameter at Breast Height (DBH) | The standard for measuring trees (4.5 feet above the ground) |
| Greenhouse gas (GHG) | Gaseous constituent of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds |
| International Organization for Standardization (ISO) | Independent international nongovernmental organization made up of standards bodies |
| Project Implementation Agreement (PIA) | Contract with the Registry setting forth the Project Operator's obligation to comply with the Protocol |
| Project Operator (PO) | Individual or entity who undertakes a Project, registers it with the registry of City Forest Credits, and is ultimately responsible for all aspects of the Project and its reporting |
| Registry | City Forest Credits/Urban Forest Carbon Registry |
| Reversal | A reversal is tree loss that results in release of credited $CO_2$ such that the carbon stock in the project falls below credited $CO_2$ |
| Vintage | The vintage of credits shall be the year in which credits are issued to a project. This includes credits issued under the status of "issued and held" in the Registry credit database |

# Introduction

This City Forest or Urban Forest Carbon Protocol sets forth the requirements for Tree Preservation projects in urban areas in the United States to quantify greenhouse gas ("GHG") emission mitigation from woody biomass. That woody biomass is referred to herein by the broader terms "city forests" or "urban forests."

This Protocol provides eligibility rules, methods for quantifying biomass and $CO_2$ storage, and reporting, monitoring, issuance of credits, reversal, and validation and verification requirements. We have been guided in drafting by one of the foundational documents for carbon protocols, the World Resources Institute/World Business Council for Sustainable Development Greenhouse Gas Protocol for Project Accounting, which describes greenhouse gas ("GHG") project accounting principles. We refer to this document as the WRI GHG Protocol.

The goal in this Protocol is to provide for accounting of GHG emission mitigation in a consistent, transparent, and accurate manner, consistent with the principles and policies set forth in the WRI GHG Protocol document. This process will form the basis for GHG reductions that are real, additional, permanent, verifiable, and enforceable, which can then result in the issuance of city forest carbon offset credits, called City Forest Carbon+ Credits™. The City Forest Credit Standard on the Registry website contains more information and discussion of Protocol elements such as additionality, permanence, and credit issuance.

A Protocol Development Report on the Registry website contains detailed information on urban forestry, urban forest carbon, original development of this protocol and prior efforts to develop urban forest carbon protocols.

Urban forest carbon projects are unique:

- Environmental and social impacts, far beyond carbon
- Impacts delivered directly to where people live, breathe, work, and recreate
- On public property or private property preserved and opened to the public as a public resource and benefit
- Most projects implemented by non-profit organizations and local governments
- Revenue from urban forest carbon projects, unlike most other types of carbon projects, goes right back into stewardship and maintenance of the trees
- Trees are preserved for their long-term benefits to people, not for another revenue stream to a forest owner, thus aligning with required long-term project duration for all carbon offsets

This Preservation Protocol is modelled after the avoided conversion protocols in rural forestry. But the threat to urban forests in and around cities and towns is different than the threats to rural forests. Urban forests are cleared for development, not harvest. The threat

to forests in cities comes from conversion to built, improved uses – industrial, commercial, or residential. If the forested stands are not preserved, not only will the carbon in the trees be emitted, but the development of the site and human activity on the site will generate emissions from the built uses and traffic to and from the site for generations to come. This Protocol issues credits only for carbon in trees that were not protected before the carbon project, were at risk or under threat of removal, and were then protected because of the carbon project. This Protocol does not issue credits for the avoided emissions that will result from the development, occupation, and use of the site, so the crediting is conservative.

The climate impacts of these projects are enormous. Not only are the future emissions from the removal of the trees avoided (although not credited), but the preservation opens forests to public use and access to "nearby nature," with all of the environmental and social impacts delivered to large numbers of people and communities in and around cities and towns.

# 1. Eligibility Requirements

## 1.1 Project Operators and Projects

A Project requires at least one Project Operator, an entity organized and licensed under the laws of its jurisdiction, or a governmental body, which undertakes a Project, registers it with City Forest Credits (the "Registry"), and is responsible for the project and its reporting.

A Project may include multiple parcels.

## 1.2 Project Implementation Agreement

The Project Operator must sign a Project Implementation Agreement (PIA) with the Registry setting forth the Project Operator's obligation to comply with this Protocol for a 40-year Project Duration.

## 1.3 Project Location

Projects must be located in parcels within or along the boundary of at least one of the following:

A. The Urban Area or Urban Cluster boundary ("Urban Area"), defined by the most recent publication of the United States Census Bureau;

B. The boundary of any incorporated city or town created under the law of its state;

C. The boundary of any unincorporated city, town, or unincorporated urban area created or designated under the law of its state;

D. The boundary of any regional metropolitan planning agency or council established by legislative action or public charter[1]. Examples include the Metropolitan Area Planning Council in Boston, the Chicago Municipal Planning Agency, the Capital Area Council of Governments (CAPCOG) in the Austin, Texas area, and the Southeastern Michigan Council of Governments (SEMCOG);

Guidance regarding 1.3 B above: where the land area of a state is fully divided into towns and/or townships, location does not guarantee full eligibility. Determination will be in alignment with the protocol intent to credit projects in and around towns.

In recognition of the urban-rural gradient and the strong public policy interest in preserving open space and forest land within and along that gradient, the Project may lie outside the boundary of one of A through D above. But any Project outside the boundary of A through D above must lie within or across parcels that constitute a sequence, chain, or progression of contiguously connected parcels. In addition, some part of the property line of one of those contiguously connected parcels must be coterminous with, or within 400 yards of, the boundary of one of A through D above.

### 1.4 Defining the Project Area

The Project Operator must specify the Project Area and provide an electronic map of the Project Area with geospatial location in any file type that can be imported and read by Google Earth Pro (example KML, KMZ, or Shapefile format).

Project Area boundaries do not have to follow land parcel boundaries. The Project Area must:

A. Be within one of the areas specified in Section 1.3 on Project Location. The Project Area may consist of contiguous or non-contiguous parcels, subject to the requirements of Section 1.3.; and

B. Meet the requirements of Section 4; and

C. Have at least 80% tree canopy in locations that receive at least 20 inches of precipitation per year or 60% tree canopy in locations that receive less than 20 inches of precipitation per year

[1] For metropolitan planning agencies whose boundaries are considerably larger than the extent of urban areas within and around them, such as the Southern California Association of Governments and other metropolitan planning organizations primarily in California and Washington state, eligibility under this criterion 1.3.D is restricted to the area within the metropolitan planning agency boundaries that is also within a 10-mile buffer of a U.S. Census Bureau-defined urban area.

Precipitation may be determined by maps produced by a government agency, or from the average of the most recent ten years of data from the nearest government precipitation measurement station for which data is publicly available.

Forests naturally have spaces between trees and gaps, and locations of these gaps may change over time. The Project Operator may choose to map gaps in the forest and exclude those non-treed areas from the Project Area. If the Project Operator does not exclude gaps from the Project Area, determination of the carbon stock and sequestration on the Project Area must account for tree canopy gaps using a method that is consistent with the methods for quantifying Project Stock in Section 11.1.A.

Project Operators are encouraged to identify Project Areas that contain only land that is developable and where trees are not specifically protected by zoning, environmental overlays, or development regulations prior to the Preservation Commitment (described in Section 4). Trees that are protected by law prior to the Preservation Commitment are not creditable.

### 1.5 Ownership or Eligibility to Receive Potential Credits

The Project Operator must demonstrate ownership of potential credits or eligibility to receive potential credits by meeting at least one of the following:

A. Own the land, trees, and potential credits upon which the Project trees are located; or
B. Own an easement or equivalent property interest for a public right of way within which Project trees are located or own the Project trees and credits within that easement, and accept ownership of those Project trees by assuming responsibility for maintenance and liability for them; or
C. Have a written and signed agreement from the land or tree owner granting ownership to the Project Operator of any credits for carbon storage or other greenhouse gas benefits, and other co-benefits delivered by Project trees on that landowner's land. If Project trees are on private property, this agreement, or notice thereof, must be recorded in the public records of the county in which the land containing Project trees is located.

## 2. Key Project Dates

### 2.1 Project Submittal Date

The Project Operator must submit a Project Application to the Registry within two years of the date of the Preservation Commitment or acquisition date, as specified under Subsection 4.1 below.

Project Operators must submit all project documents for crediting to the Registry within six months of approval of the Project Application.

If a Project includes multiple parcels or properties, the starting date for the two-year period within which a Project Application must be submitted is the date of the last Preservation Commitment or last acquisition date for any parcel or property within that Project.

The Registry retains sole discretion over approval of applications and registration of projects.

### 2.2 Project Duration

The Registry will issue credits based on a commitment to a 40-year Project Duration, including a 40-year Preservation Commitment (see Section 4.1 for definition of Preservation Commitment). Project Duration starts on the Credit Commencement Date (the recordation of the Preservation Commitment). Projects may earn credits after the Project Duration as provided in Section 10.

### 2.3 Date for Recordation of Preservation Commitment

The Recorded Encumbrance defined in Section 4.1 as the Preservation Commitment must be recorded no later than six months after Registry approval of the Project Application.

### 2.4 Credit Commencement Date for Issuance of Credits

For projects whose credits are issued over more than one year, the date at which each subsequent issuance occurs is the annual anniversary of the recordation date of the document containing the Preservation Commitment. This date shall be called the "Credit Commencement Date."

For example, if the recordation date of a recorded easement containing the Preservation Commitment protecting the Project trees is on June 1, 2026, then the second year's issuance of credits occurs on June 1, 2027, which is one year from the Credit Commencement Date.

### 2.5 Monitoring Reports

The Project Operator shall submit monitoring reports under Section 8 every three years dating from the first Verification Report for the Project Duration.

The Registry ensures permanence by 1) requiring triennial monitoring reports under Section 8 throughout the Project Duration, 2) requiring all Project Operators to sign a Project Implementation Agreement under Section 1.2 agreeing to comply with all Protocol

requirements, including reversals, and 3) maintaining a Reversal Pool Account holding credits retained from projects to compensate for Unavoidable Reversals under Section 9.

## 2.6 Vintage of Credits

The vintage of credits shall be the year in which credits are issued to a Project. This includes credits issued under the status of "issued and held" in the Registry credit database.

## 2.7 Project Timeline and Key Dates

Key project dates are summarized in the table below:

| **Project Component** | **Timeline and Key Dates** |
|---|---|
| Preservation Commitment (recordation date) | No more than six months after Registry approval of Project Application |
| Project Application | No more than two years after Preservation Commitment recordation date or acquisition date |
| Project Design Document and Attachments | Submit to Registry within six months of Registry approval of Project Application |
| Credit Commencement Date | Recordation date of the Preservation Commitment |
| Subsequent Credit Issuances | Based on annual anniversary of the recordation date of the Preservation Commitment |
| Monitoring Reports | Due every three years for the Project Duration. Due on the anniversary of the first Verification Report |
| Project Duration | 40 years, starts on the Credit Commencement Date |

# 3. Project Documentation and Record-keeping

The Project Operator shall submit all documents required by this Protocol and the Registry, using templates or forms supplied by the Registry, including:

- Project Application
- Project Implementation Agreement
- Ownership or Eligibility to Receive Potential Credits
- Project Design Document and supporting attachments
- Preservation Commitment
- Attestations of Additionality
- Attestation of No Double Counting and No Net Harm
- Carbon and Co-Benefit Quantification
- Forest Composition Report
- Social Impacts
- Monitoring Reports

The Project Operator shall keep all documents and forms related to the Project for the Project Duration. If the Project Operator seeks credits after the Project Duration, it must retain all documents for as long as it seeks issuance of credits. This information may be requested by the Registry at any time.

The Registry requires data transparency for all Projects. For this reason, all Project data reported to the Registry will be publicly available on the Registry website or by request.

# 4. Demonstrating Preservation and Threat of Loss

The Project Operator must meet the requirements of Sections 4.1, 4.2, 4.3, and 4.4.

4.1 That the trees in the Project Area are preserved from removal by a recorded easement, covenant, or deed restriction (referred to hereafter as "Recorded Encumbrance") with a term of at least 40 years. This action is referred to as the "Preservation Commitment." This Recorded Encumbrance must be recorded no later than six months after Registry approval of the Project Application.

4.2 That prior to the Preservation Commitment in Subsection 4.1 above, the Project trees were not preserved from removal through a Recorded Encumbrance or other prohibitions on their removal

4.3 That prior to the Preservation Commitment in Subsection 4.1 above, the Project Area:

A. Was in a land use designation that allows for at least one non-forest use. Non-forest uses include industrial, commercial, transportation, residential, agricultural, or resource other than forest, as well as non-forest park, recreation, or open space uses, and

B. As general guidance, critical areas such as wetlands, riparian buffers, floodplains, or steep slopes are excluded from the carbon project area because development is either prohibited, severely restricted, or subject to highly complex and discretionary permitting decisions. A Project Operator may seek specific guidance from the Registry for particular factual or legal situations.

4.4 That prior to the Preservation Commitment in Subsection 4.1 above, the Project Area meets at least one of conditions A, B, or C:

A. Was surrounded on at least 30% of its perimeter by non-forest, developed, or improved uses, including residential, commercial, agricultural, or industrial. The following sentences are provided as clarification of this provision. If the property parcels containing the Project Area are adjacent to a road, the far side of the road can be used as the perimeter when calculating the fraction of the perimeter that is developed. If the property parcels containing the Project Area are adjacent to a non-developable land feature, such as a stream, the far side of the non-developable feature can be used as the perimeter when calculating the fraction of the perimeter that is developed. If the Project Area is surrounded by land in the same ownership as the Project Area, the 30% perimeter can apply to the surrounding land. If the Project Area consists of several parcels not contiguous, the 30% perimeter requirement can be calculated based on the sum of the perimeters of all the parcels; or

B. Had been sold or conveyed or had an assessed value within three years of preservation under Subsection 4.1 for greater than $8,000 average price per acre for the bare land. When the assessed value is a percentage of the appraised value, as determined by the local assessing authority, then the appraised value is the value to be used for this determination; or

C. Would have a fair market value after conversion to a non-forested "highest and best use" greater than the fair market value after preservation in Subsection 4.1, as stated in a "highest and best use" study from a state certified general real estate appraiser in good standing.

# 5. No Double Counting and No Net Harm

5.1 No Project shall seek credits on trees, properties, or projects that have already received credits from the City Forest Credits Registry or any other carbon registry, with the exception of credits for additional growth on Project Area under Section 11.6. The Project Operator must sign an attestation that there is no double counting of credits.

5.2 The Project Operator must check the location of the Project Area against the Registry-provided geospatial database, which contains geospatial data on the project areas of all registered urban forest carbon preservation projects to date. The Project Operator must submit documentation showing no overlap of Project Area with any other registered project. This can take the form of a map that shows the Project Area mapped against the Registry-provided geospatial data. As part of the Validation and Verification process, the appropriate tool on GIS software will be used to analyze the intersection of the Project Area and the locations of all other registered urban forest carbon preservation projects. The intersection or overlap must be zero acres, to ensure no double counting of credits. Any portion of the Project Area that is identified as overlapping with an existing carbon project will be excluded from the Project.

5.3 No Project shall cause net harm to the environment of urban communities. The Project Operator must sign an attestation that there is no net harm

# 6. Additionality

A project activity is additional if it can be demonstrated that the activity results in emission reductions or removals that are in excess of what would be achieved under a "business as usual" scenario and the activity would not have occurred in the absence of the incentives provided by the carbon markets. In all cases, projects that are required by law or regulation are excluded.

Projects that use this avoided conversion Tree Preservation Protocol must meet additionality requirements embedded in the specific required elements of the Protocol.

## 6.1 Additionality Requirements

The CFC Standard and the Tree Preservation Protocol ensure additionality through the following requirements that are contained in Section 4:

- Prior to the Preservation Commitment, the trees in the Project Area were not protected via easement or recorded encumbrance or in a protected zoning status that preserves the trees, and
- Prior to the Preservation Commitment, the land use designation in the Project Area allowed for a non-forest use, and
- Prior to the Preservation Commitment, the trees in the Project Area passed one of three tests to show risk of removal or conversion out of forest.

This CFC Preservation Protocol is an avoided conversion methodology that uses as a baseline a site-specific analysis of carbon that would be emitted if at-risk trees were removed and this land in urban areas and the rural gradient were developed to its highest and best use according to site-specific zoning and land use regulations.[2] In other words, this is a project-specific baseline, not a methodology using reference areas; only the trees that would be removed under the site-specific development scenario, and only the soil that would be converted to impervious surface under the site-specific baseline development scenario, are allowed to be credited.

The Tree Preservation Protocol sets out three tests to determine whether the trees or forest in a Project Area face a threat or risk of tree removal or conversion out of a forested use. The Project must demonstrate that the Project Area meets at least one of the following three tests:

A. Was surrounded on at least 30% of its perimeter by non-forest, developed, or improved uses, including residential, commercial, agricultural, or industrial. Note, Protocol Section 4.4. contains additional text for clarification of this test; or

B. Project land been sold or conveyed or had an assessed value within three years of preservation under Subsection 4.4 for greater than $8,000 average price per acre for the bare land; or

[2] The project-specific baseline approach described above and in more detail in Section 11 of the CFC Preservation Protocol utilizes similar principles of additionality to those used by the Climate Action Reserve's U.S. Forest Protocol (Version 5.1, July 20, 2023), which, per the CAR Protocol Section 6.3 Avoided Conversion, estimates the project baseline as the rate of conversion and removal of carbon stocks under the highest-value land use for the Project Area. The CAR Protocol does not use reference areas for the baseline.

C. Project land would have a fair market value after conversion to a non-forested "highest and best use" greater than the fair market value after preservation in Subsection 4.4, as stated in a "highest and best use" study from a state certified general real estate appraiser in good standing.

The first two of these "risk of conversion" tests are empirical. If the Project Area is surrounded on at least 30% of its perimeter or is valued or sold within the three prior years at more than $8,000 per acre, then the Project meets this requirement of risk of tree removal or conversion. Both tests reflect the development pressure on land in metropolitan areas. If a forested parcel in a metropolitan area is surrounded on 30% of its perimeter by improved or developed uses, and if the zoning allows a more intensive non-forest use, and if the trees are not protected, then the Project meets the test of risk of removal or conversion.

Similarly, if a forested parcel has been sold or assessed at greater than $8,000 per acre, then the development pressure is significant. With timber land valued at approximately $2,000 per acre, a valuation of four times greater than that in a metropolitan area indicates that the value of the parcel is in development, not in trees, and that the risk of conversion is high.

The third test also rests upon the value of the land as preserved versus its value as developed. If the highest and best use of the land as developed under existing zoning is higher than the value of the land preserved in forest, then the risk of conversion is high.

Taken together, the above elements allow crediting only for unprotected trees, at risk of removal, which are then protected by a project action of preservation, providing additional avoided GHG emissions.

The Project Operator must also demonstrate compliance with the following additionality requirements.

## 6.2 Prior Consideration

The Project Operator must show there was prior consideration of participating in a carbon project before acquiring or protecting property. Prior consideration means that carbon credits were considered as part of the decision to acquire rights to forested land and before the Preservation Commitment in Section 4 was recorded on the property.

Project Operators must meet at least one of the following tests for prior consideration:

A. sign a Notice of Intent before or at the same time as acquisition of the rights to the Project Area and prior to the Preservation Commitment;

B. include a specific reference to carbon crediting or the work of CFC in the documentation relating to acquisition of rights to the Project Area and before the recordation of the Preservation Commitment. For clarification, the phrase "documentation relating to acquisition of rights to the Project Area" includes any feasibility analyses, evaluations of value, budgeting, title work, and documents drafted for the acquisition.

C. show that the Project Operator has already completed a carbon project; or

D. provide documentation and a timeline showing that the potential Project Operator was familiar with the work of CFC to learn more about carbon crediting before the land acquisition closed and before the Preservation Commitment was recorded.

### 6.3 Financial Additionality

Project Operators must demonstrate that they require carbon finance to conduct a successful project. Even with substantial non-carbon finance support, projects can be additional if investment is required, risk is present, and/or human capital must be developed. Specifically, Project Operators must show that:

- there are limited financial mechanisms to fund expenses that are needed for a successful project (Financial Attractiveness) and
- carbon finance plays a critical role in making possible a successful forest preservation project (Carbon Revenue Impact)

Project Operators can show Financial Attractiveness through facts or data in the PDD, including some or all of the following:

- Forest preservation on the protected Project Area will not generate revenue
- The definition of a successful project is not mere acquisition of unprotected forested land, but includes long-term maintenance and stewardship needed to preserve the forest and its carbon stock
- Funding for acquisition or long-term maintenance and stewardship is difficult to obtain

Project Operators can show Carbon Revenue Impact through facts or data in the PDD, including some or all of the following:

- There are not non-carbon financial incentives sufficient to cover acquisition or long-term maintenance and stewardship costs

- Budgeted expenses for acquisition or long-term maintenance and stewardship require carbon finance

### 6.4 Common Practice

Projects Operators must also demonstrate that project activities are not "common practice," leaving aside financial or regulatory incentives. Project Operators may provide 1) an analysis of project-specific activities; or 2) an activity penetration analysis demonstrating that, at a national scale, the measured level of activity is less than 5% of the maximum adoption capacity. In the latter case, Project Operators may use the current version of the Registry's Activity Penetration Analysis of Urban Forest Conservation.

Additionality is embedded also in the quantification methodology. Projects cannot receive credits for trees that would have remained had development occurred, nor can they receive soil carbon credits for soil that would have been undisturbed had development occurred. Sections 11.2 and 11.3 of the Protocol address displaced development to other lands. This is generally categorized as leakage, but it contains an additionality element as well. Section 11.4 addresses leakage and provides the deduction calculations for displaced development.

## 7. Issuance of Credits

### 7.1 Credit Issuance Requirements

The Registry will issue City Forest Carbon+ Credits, representing a tonne of carbon dioxide equivalent ($CO_2e$) per credit plus other ecosystem benefits. To request credits, the Project Operator shall submit a completed Project Design Document to the Registry, including quantification data and other required information set forth in Section 3 above.

As set forth in Section 13, the Project Operator's compliance with both eligibility and quantification requirements shall be reviewed and verified by a third-party verifier, known henceforth as a Validation and Verification Body (VVB). The Registry shall issue credits only after receiving a Verification Report, completing its own Registry Validation Report, and only in the amount and schedule set forth in the Verification Report (see Section 13) and per the Project Implementation Agreement.

### 7.2 Credit Issuance Schedule

The "Initial Crediting Period" refers to the period when credits are issued under the schedule set forth in the first Verification Report.

Credits on properties or projects greater than 50 acres are issued during the Initial Crediting Period, as set forth in this section below. Credits and the anniversaries of credit issuance shall be dated from the recordation date of the document containing the Preservation Commitment as defined in Section 4.1 (per Section 2 on Key Dates, this dating of the credits is referred to as the "Credit Commencement Date.")

The Registry shall continue to issue credits during the Initial Crediting Period and on the schedule contained in the Verification Report until modification of that issuance of credits is necessary due to noncompliance under Section 8 on Monitoring and Reporting or a Reversal under Section 9.

The Project Operator may request third-party verification, followed by issuance of credits if verified, at any time after the Preservation Commitment is in place protecting project biomass and after all project documents have been submitted, subject to the provisions below.

Subject to all the requirements of this Protocol, credits are issued as follows after third-party verification and validation by the Registry:

- If the Project Area is 50 acres or less, credits are issued after third-party verification and validation by the Registry.
- If the Project Area is greater than 50 acres and not more than 200 acres, credits are issued attributable to the equivalent of 50 acres of the Project.
- If the Project Area is greater than 200 acres, credits will continue to be issued in 50 acre increments beyond 5 years. CFC may allow variations on a case-by-case basis.
- At each subsequent annual anniversary of the Credit Commencement Date, and as set forth in the Verification Report's schedule of issuance of credits, the Project Operator may request issuance of credits until all attributed credits have been issued.

For example, if the Project Area is 78 acres, the Project Operator would quantify the $CO_2e$ eligible for crediting on all 78 acres. After third-party verification and validation by the Registry, the Project is eligible to be issued credits for the equivalent of 50 acres, with remaining credits issued on the anniversary of the Credit Commencement Date for the remaining 28 acres.

This issuance of credits over time reflects the likely staging of development over time if the project area were to have been developed. The schedule of issuance also reflects that one of the first actions taken upon metropolitan land being developed is clearing and grading. Developers often clear and grade as early as possible to "vest" development rights in the

project, to discourage opposition to a project, or to reduce the cost of constructing in-ground infrastructure such as sewer and water.

Credits for additional growth may be issued after the Initial Crediting Period under Section 11.6. Those credits may be issued only after submittal of updated project documents, including updated eligibility documentation, updated quantification of carbon including re-calculation of carbon stock relative to the baseline, validation, and verification. See Section 11.6 for more detail.

### 7.3 Credits for Reversal Pool Account

The Registry will issue 90% of Project credits earned and requested and will hold 10% in the Registry's Reversal Pool Account.

## 8. Monitoring and Reporting

The Project Operator must submit a triennial monitoring report to the Registry throughout the Project Duration.

In each monitoring report, the Project Operator must report on tree conditions across the Project Area to the Registry. These reports must be submitted no less frequently than on the triennial anniversary of the date of the first Verification Report. If a monitoring report is due under the triennial reporting schedule after the 40-year Project Duration, the last monitoring report may be submitted at the end the 40-year Project Duration. If projects opt to quantify growth throughout the project duration and receive additional credits, monitoring must continue for 40 years after the issuance of those additional credits. For example, if a project receives credits for additional growth in Year 20, the project will need to monitor and submit reports for an additional 40 years after year 20 (through year 60 from the start of the original project).

The reports must be in writing, and the Project Operator must attest to the accuracy of the reports. The reports must be accompanied by a canopy analysis report to show the most current tree canopy percentage. This report can be completed in iTree Canopy or utilize similar methods to evaluate some form of telemetry or imaging that captures tree canopy, defined as Google Earth, aerial imagery (distinguishing tree canopy from shrubs and other non-tree vegetation), or LiDAR. The Project Operator must utilize this imaging to report on any canopy loss. The initial report is intended to be a low-cost assessment of any tree canopy loss, and if the monitoring report indicates to the Registry that a credit reversal may have occurred, the Registry will require more precise quantification of the biomass carbon stock present within the Project Area.

The reports shall state the cumulative net area of tree canopy loss within the project area, relative to the canopy area quantified in the first verification of the project. The report shall describe the method used to quantify canopy loss.

If the Project Operator estimates cumulative net loss of 8% or more of tree canopy, further investigation will be required. The Registry will work with the Project Operator to determine an efficient way to quantify carbon stocks within the Project Area and whether there is a reversal under Section 9.

The report shall also estimate the number of acres of significant soil disturbance that has occurred since the previous report. Plowing and removal of topsoil both constitute significant soil disturbance, however creating non-motorized trails for recreation is allowed and does not constitute significant soil disturbance. For the purposes of these reports, areas of soil exposed by trees tipping over are not counted as areas of significant soil disturbance.

If a Project Operator fails to submit a report when due under this section, the Registry shall notify the Project Operator of such failure. The Project Operator shall then have 60 days to submit reports under this section.

If a Project Operator fails to monitor or to report after receiving notice and an opportunity to cure its failure under the preceding paragraph, the Registry can investigate and take actions including assessing carbon stock and invoking the reversal provisions of Section 9 as well as cancelling of the Project and all credits issued.

Project Operators are always subject to the reversal provisions of Section 9, regardless of any monitoring and reporting they do.

# 9. Reversals

Reversals can occur if tree loss results in release of credited $CO_2$ into the atmosphere. Or, put it another way, a reversal can occur if there is a loss of stored carbon serving as the basis for credits for GHG emission mitigation after credits have been received by projects but before the expiration of the Preservation Commitment. (References in this section to "carbon" shall mean $CO_2e$ serving as the basis for credits for GHG emission mitigation). A "Reversal" is loss of stored carbon such that the remaining stored carbon within the Project Area is less than the amount of stored carbon for which Registry credits have been issued.

The Registry will retain in a Reversal Pool Account 10% of all credits issued to preservation projects and 5% issued to planting projects. This Reversal Pool Account shall be used to compensate for Unavoidable Reversals as set forth below. The Registry does not compensate Project Operators for the retained credits in the Reversal Pool Account. The

Registry may provide in the future for distribution of credits in the Reversal Pool Account to Project Operators if the actual reversals are less than current evaluation of risk.

This section sets forth rules for determining the type of Reversal, calculating the amount of the Reversal, and compensating for the Reversal.

## 9.1 Avoidable Reversals

### A. Notice and Calculation of Avoidable Reversals

An Avoidable Reversal is any Reversal that is due to the Project Operator's negligence, gross negligence, or willful intent, including harvesting, development, and harm to the trees in the Project Area due to the Project Operator's negligence, gross negligence or willful intent.

If the Project Operator becomes aware of a potential Avoidable Reversal, the Project Operator shall deliver written notice to the Registry within 60 days of becoming aware of the potential Reversal. If the Registry determines that an Avoidable Reversal has occurred, it shall deliver written notice to the Project Operator.

Within 90 days of receiving written notice from the Registry of an Avoidable Reversal, the Project Operator shall calculate the number of remaining creditable tonnes $CO_2e$ in the Project Area using the quantification methods contained in Section 11 of this Protocol. The Project Operator may use another quantification method only after receiving written approval by the Registry.

The Registry shall then determine the number of credits reversed and deliver written notice to the Project Operator of that amount and its obligation to compensate for those reversed credits.

### B. Compensation for Avoidable Reversals

Within 60 days of being notified of the number of credits that it is obligated to replace, the Project Operator shall submit to the Registry a sufficient number of City Forest Carbon+ Credits to cover the shortfall. One way for Project Operators to provide replacement credits is to purchase these from other projects that have received credits from the Registry.

Quantifications of carbon stocks determined by the Registry shall be considered to be verified amounts under this section.

### 9.2 Unavoidable Reversals

An Unavoidable Reversal is any Reversal not due to the Project Operator's negligence, gross negligence or willful intent, including, but not limited to disease, fire, drought, cold, ice/snow, wind/hurricane, flooding, earthquake, landslide, and volcano.

#### A. Notice and Calculation of Unavoidable Reversals

If the Project Operator becomes aware of a potential Unavoidable Reversal, the Project Operator shall deliver written notice to the Registry within 60 days of becoming aware of the potential Reversal. If the Registry determines that an Unavoidable Reversal has occurred, it shall deliver written notice to the Project Operator.

The Registry shall calculate the number of remaining creditable tonnes $CO_2e$ in the Project Area using the quantification methods contained in Section 11 of this Protocol. If the Registry determines that more credits have been issued to the Project (counting both credits issued to the Project Operator and credits transferred to the Registry's Reversal Pool Account), the Registry shall notify the Project Operator of its calculation of remaining $CO_2e$ and of the shortfall.

#### B. Compensating for Unavoidable Reversals

Unavoidable Reversals are compensated by credits retired by the Registry from the Registry's Reversal Pool Account.

If a Project has had its carbon stock go below the carbon stock necessary to support credits issued by the Registry, no further credits will be issued to the Project until the carbon stocks are above the amounts needed to support issued credits, including credits allocated to the Registry's Reversal Pool Account.

If a Project Operator fails to compensate for a reversal, that Operator's projects may be terminated and the Project Operator may be barred, at the sole discretion of the Registry, from submitting applications to the Registry.

## 10. Continuation of Projects after 40-Year Project Duration

After a 40-year Project Duration, Projects may continue their activities, submit Project Documents required to receive credits (see Section 3), and seek issuance of credits for additional growth under Section 11.6. The Project Operator must submit an updated Project Design Document with quantification and comply with all applicable requirements

of this Protocol to obtain credits for additional growth or credits beyond the 40-year Project Duration.

# 11. Quantification for Credits

The Registry will issue City Forest Carbon+ Credits to a Project only after quantification by a Project Operator, validation by the Registry, verification by a Validation and Verification Body approved and contracted by the Registry, and a request for issuance of credits by a Project Operator. The Project Operator must follow the following quantification methods and use the City Forest Credits Quantification Calculator.

There are five steps in the quantification of carbon and co-benefits generated by a Project. These steps are described in full in this section, beginning with Sub-section 11.1. In summary, the five steps are:

1. Estimate the biomass stock present, and adjust for uncertainty[3] in the estimate to calculate the "Accounting Stock" (Section 11.1)

2. Calculate the fraction of the Accounting Stock that likely would be emitted as a result of development, to calculate "Avoided Biomass Emissions" (Section 11.2)

3. Calculate "Avoided Soil Carbon Emissions" (Section 11.3)

4. Apply the deductions for displaced development (leakage) to "Avoided Biomass Emissions" and "Avoided Soil Carbon Emissions" (Section 11.4)

5. Quantify Co-Benefits (Section 11.5)

The Project Operator may elect to account for additional growth of trees within the Project Area and seek credits after the Initial Crediting Period (Section 11.6).

## 11.1 Quantifying Stored Carbon Stock Present within the Project Area

Acceptable ways of quantifying the stored carbon stock present within the Project Area include:

[3] Overall uncertainty for Project activities includes uncertainties in quantifying the carbon stock and uncertainty around the extent of conversion (baseline scenario). The measurement uncertainties are accounted for through the deductions described in Section 11.1.A.iv and 11.1.B. The baseline uncertainty is minimized by using actual values from local zoning and development regulations, and mitigated by the small Project area sizes.

A. The afforestation table, Appendix B, from the US Forest Service General Technical Report (GTR) NE-202 appropriate to the geographic area and forest type, "total nonsoil" carbon stock for stands of the age of the forest on the Project Area. To use the quantification method of this section 11.1.A, Projects must meet the following conditions:

i. The Project Operator must submit a Forest Composition Report written by a qualified forester, arborist, or ecologist based on a site visit not more than one year prior to the date of the Report. The Project Operator must use the Forest Composition Report Template provided by the Registry (Appendix A) and must include the information required in that Template.

ii. The Project Area must be assessed and divided into stands by the forest type in the relevant geographic area in GTR NE-202 and by stand age. Stand age may be determined by publicly available historical materials, such as photographs, land use records, or timber harvest records, documenting afforestation of the Project Area or presence of substantially complete tree cover on the Project Area. If aerial photography is used, the year applied is from the earliest aerial photograph that shows a closed canopy. The Project Operator can round up to the next year class in the GTR NE-202 tables. Age may also be determined by species identification and coring of a random or well distributed systematic selection of trees. Other methods to determine forest type and stand age may be used, subject to approval by the Registry. If the Project Area is classified as one stand, at least 30 co-dominant trees well distributed across the Project Area will be used to calculate stand age. If the Project Area is divided into more than one stand, at least 20 co-dominant trees per stand will be used to determine forest type and stand age. For each stand, stand age shall be the median age of the sampled trees.

iii. The general health of the stand, including the presence of significant pests or diseases, shall be noted. The Project Operator must measure the percent canopy cover. The Project Operator may use i-Tree Canopy, LiDAR, or another method approved by the Registry. The Project Operator may prove canopy cover by using the i-Tree Canopy tool (http://www.itreetools.org/) and submitting to the Registry the i-Tree Canopy report for the Project Area, plus the i-Tree Canopy export file containing the coordinates of all evaluated points and the evaluation of each point. If using sampling like i-Tree rather than a wall-to-wall map, enough points must be sampled so that the

standard error of the percent canopy cover is less than 10%. The carbon stock attributed to the Project equals:

Project Stock = Stock * Percent

Where "Project Stock" is the number of tonnes of stored carbon stock used for subsequent calculations of credits attributed to the project, "Stock" is the live tree or total non-soil carbon stock per acre estimated using tables from GTR NE-202 times the number of acres in the Project Area, and "Percent" is the percent canopy cover.

iv. Because the tables in GTR NE-202 cover a wide range of conditions, some stands will have less carbon stock than the amount estimated by using the tables. If a Project estimates carbon stock using these tables, the "Accounting Stock" shall be 80% of the "Project Stock" estimated in the equation above in this Subsection. The application of this 80% factor to the calculation of carbon stock using the GTR NE-202 tables is an additional deduction imposed to make the GTR NE-202 -based calculation conservative.

v. If a Project conducts quantification under Sections 11.1.B or 11.1.C, it cannot use the quantification method or results of 11.1.A.

B. An inventory of live trees at least 5" in diameter at 4.5' above the ground (where the height above the ground is measured on the uphill side of the tree) present on the Project Area using i-Tree methods and tools. Stand condition shall be evaluated by collecting condition information for inventoried trees or by noting the general health of the stand, including the presence of significant pests or diseases. If a sample inventory is performed in lieu of a complete inventory, the Project Area shall be assessed and divided into one or more stands based on location, forest type, and stand age and appropriately sampled within each stand. Sample plots must be randomly located within each stand. Project Operators can utilize the iTree Eco random plot sampler or the ArcGIS Pro Create Random Points tool to generate plot locations. When using this method, the standard error of the sample must be less than 20% of the mean estimated carbon stock. The Accounting Stock attributed to the project is the carbon stock calculated by i-Tree, minus one standard error of that estimate. For example, if the mean estimated carbon stock is 100 tonnes, and the standard error is 10 tonnes, then the number of Accounting Stock attributed to the project is 90 tonnes.

C. A forest inventory using accepted forestry methods and biomass equations that are valid for the species, growth conditions, and tree sizes to which the equations are being applied and that are published in a peer reviewed

publication, by a government agency, or by a not-for-profit organization. The Project Operator must obtain approval from the Registry before commencing a forest inventory. The Project Operator may choose to include smaller trees, standing dead trees, and/or down dead wood. When using this method, the Accounting Stock attributed to the Project is the mean estimated carbon stock, minus one standard error of that estimate.

To learn specifics about quantification methods, visit the Measure Your Forest Carbon: Quantification Toolkit. Additional step-by-step instructions for completing Method 11.1.B, produced by CFC and Western Reserve Land Conservancy are available upon request.

### 11.2 Areas Expected to Remain in Trees after Potential Development

When an area is developed, some trees may be retained. This Subsection adjusts the "Accounting Stock" calculated in the preceding Subsection to adjust for the fact that even with development, some of the trees within the Project Area may remain, and the carbon in these remaining trees is not emitted during development. To account for these trees that might remain after development, the Project Operator must do the following accounting:

A. In industrial, agricultural, commercial, mixed use, and other primarily non-residential zones, 90% of the Accounting Stock on the Project Area is the "Avoided Biomass Emissions"; or

B. In residential zones and agricultural zones that allow low-density residential, the smaller of:
   i. 90% of the Accounting Stock, or
   ii. Two acres per allowed dwelling unit plus 10% of the remaining Project Area, calculated as:

Avoided Biomass Emissions = Accounting Stock * (((2 * Dwellings) + ((Project Acres – (2 * Dwellings)) * 0.1)) / Project Acres)

Where "Accounting Stock" is defined in Section 11.1, "Dwellings" is the number of dwelling units allowed by zoning to be built within the Project Area, and "Project Area" is the area (in acres) specified by the Project Operator per Section 1.4. If zoning for a Project allows less than three dwelling units per acre, the calculation in B.ii. must be done to confirm which is the smaller value.

### 11.3 Quantification of Soil Carbon

The Project may claim avoidance of emissions from soil carbon caused by conversion of soils to impervious surfaces in the Project Area. Avoided soil carbon emissions shall be no

more than the lesser of the area of avoided forest clearing calculated in Section 11.2 and:

A. On commercial, industrial, and mixed use and other non-residential zones, if the applicable zoning and development rules specify a maximum fraction of parcel area that may be in impervious surface, up to the allowed impervious area may be claimed as avoided conversion to impervious surface. If the applicable zoning and development rules do not limit impervious area, 90% of the Project Area in commercial, industrial, agricultural (where annual crops and plowing are common practices in that region) or mixed-use zones may be attributed to being eligible for conversion to impervious surface. If the parcel is zoned agriculture and specifically allows low-density residential, then you must use the residential avoided conversion to impervious surface percentage.

B. On residential zones, if the applicable zoning and development rules specify a maximum fraction of parcel area that may be in impervious surface, up to the allowed impervious area may be claimed as avoided conversion to impervious surface. If the applicable zoning and development rules do not limit impervious area, 50% of the Project Area that is in a residential zone may be attributed to being eligible for conversion to impervious surface.

C. For development uses of the Project Area that retain live vegetation on the ground, such as creation of recreational grass playfields, there are no soil carbon emissions attributed to development. If potential development of the Project Area would include some vegetative cover, and some non-vegetated surface uses (such as parking lots, restrooms associated with playfields, or artificial turf playfields), divide the Project Area into areas with vegetation and without vegetation, and analyze each area separately.

If the project zoning allows for multiple land uses (example: mixed use), the project must utilize the most conservative avoided conversion to impervious surface percentage to avoid over crediting. If there is existing impervious surface within the Project Area, that existing impervious area must be subtracted from the potential area of impervious surface underdeveloped use, to calculate net area of avoided impervious surface for calculating avoided soil carbon emissions.

Soil carbon values for both 11.1.A and 11.1.B will be determined using the GTR NE-202 tables “soil organic” carbon. This number is represented as tons of carbon on the GTR tables. This number will be multiplied by 3.67 (or 44/12) to align the soil carbon units to metric tonnes of carbon dioxide equivalent of Avoided Soil Carbon Emissions per acre of net avoided impervious surface.

Where "Avoided Impervious Surface" is the number of acres within the Project Area that are developable according to the requirements of Section 4.3, in units of acres, after the adjustments specified in Sections 11.3.A and 11.3.B.

## 11.4 Calculation of Deduction for Displaced Development

Preventing development of some lands is likely to displace development to other lands. Displacing development to other lands may or may not cause emissions from trees and soil. If development is displaced to locations with no trees but with minimally disturbed soils, there would be no biomass emission attributed to the displacement but there would be soil carbon emissions resulting from the displacement. If development is displaced to previously developed sites, there could be negligible emissions from biomass and soil from sites where development is displaced to.

All projects are assigned a deduction based on average emissions from displacement of development throughout the U.S. The calculation of the displaced development deduction is described in Appendix B.

A. Of the total number of tonnes of Avoided Biomass Emissions from within the Project Area, 18.3% are assumed to be emitted from development displaced from the Project Area. Therefore, the number of creditable tonnes of Avoided Biomass Emissions is calculated by reducing the number of tonnes of Avoided Biomass Emissions calculated in Section 11.2 by 18.3%. In the sequence of calculations, this reduction is done immediately prior to calculation of Reversal Pool obligations. The calculation is:

   Credits from Avoided Biomass Emissions = Avoided Biomass Emissions * (1 - 0.183)

B. Of the total number of tonnes of Avoided Soil Carbon Emissions from within the Project Area, 30.3% are assumed to be emitted from development displaced from the Project Area. Therefore, the number of creditable tonnes of Avoided Soil Carbon Emissions is calculated by reducing the number of tonnes of Avoided Soil Carbon Emissions attributed to within the project area by 30.3%. In the sequence of calculations, this reduction is done immediately prior to calculation of Reversal Pool obligations. The calculation is:

   Credits from Avoided Soil Emissions = Avoided Soil Carbon Emissions * (1 – 0.303)

Credits attributed to the Project are the sum of Avoided Biomass Emissions plus Avoided Soil Carbon Emissions, after adjusting for displacement of development as provided for in this section, plus credits for tree growth if growth is quantified.

Of the credits attributed to the Project, validated by the Registry, verified by a third-party verifier, and issued to the Project, 90% shall be issued to the Project Operator and 10% shall be transferred to the Registry Reversal Pool Account.

### 11.5 Quantifying Co-Benefits

The Project Operator must calculate co-benefits separately from $CO_2$(e). The Registry supplies a Co-Benefit Quantification Calculator developed by Registry scientists that Project Operators shall use to quantify co-benefits for their climate zone. The tool includes instructions on data and inputs required for co-benefit calculation of rainfall interception, reductions of certain air compounds, and energy savings. The scientific basis for the co-benefits is set out in Appendix C to this Protocol.

### 11.6 Additional Growth – New Quantification of Carbon Stock Relative to Baseline

Credits for additional growth may be issued after the Initial Crediting Period only after submittal of updated project documents, including updated eligibility documentation, updated quantification of carbon including re-calculation of carbon stock relative to the baseline, validation, and verification. Only the quantified, validated, and verified increase in stored carbon from the prior issuance of credits may be requested. Increases may be quantified using any method approved by the Registry in Section 11.1, including deductions for calculation of the "Accounting Stock." The fraction of the "Accounting Stock" of new biomass sequestration in new growth that counts as "Avoided Biomass Emissions" is the same as the fraction that is the number of "Avoided Biomass Emissions" present at the Project start date divided by the "Accounting Stock" present at the Project start date.

## 12. Social Impacts

In 2015, all United Nations Member States agreed to the 2030 Agenda for Sustainable Development, sharing a blueprint for peace and prosperity for people and the planet, now and into the future. The 17 United Nations Sustainable Development Goals (SDGs) are an urgent call for action and global partnership among all countries, representing key benchmarks for creating a better world and environment for everyone. There are 169 targets and associated indicators for the 17 SDGs.

Urban tree preservation carbon projects drive action towards one or more SDGs.

The Project Operator shall use the Registry's Carbon Project Social Impact Template to evaluate the SDGs to determine and describe how a Project provides social impacts that contribute towards achievement of the global goals. The City Forest Credits Carbon

Projects Social Impact Background Document describes the development of this Social Impact Reporting in more detail.

# 13. Validation and Verification

The Registry requires validation and verification of all GHG projects before it issues credits. The Registry will conduct validation and will retain a qualified and approved independent Validation and Verification Body for verification of all projects.

## 13.1 Validation

The Registry shall conduct validation activities at three times. The Registry shall document it validation activities in a written report that shall be posted publicly with other project documents.

A. Pre-Application

Before reviewing an application, the Registry conducts a validation screening:

- Validate eligibility under the Protocol eligibility requirements
- Validate the Project Operator's understanding of the commitments it must make if it proceeds with the Project:
  - Complying with the Protocol
  - Submitting project documents, including a Project Implementation Agreement with Registry
  - Quantifying carbon dioxide and ecosystem co-benefits according to the appropriate methodology
  - Conducting monitoring and reporting for the Project Duration

B. Before Third-Party Verification

Upon submittal of a final Project Design Document (PDD) and before third-party verification, the Registry will:

- Review the PDD and its supporting documents for:
  - Compliance with Protocol PDD requirements
  - Demonstration that the Project meets the Protocol eligibility requirements

C. After Receiving the Verification Report

When the third-party verifier produces its Verification Report, the Registry then reviews that Report to ensure the following:

- The Verification Report accurately reflects the documentation contained in the PDD and supporting documents.

## 13.2 Verification

The Registry will retain a qualified and approved Validation and Verification Body (VVB) to verify compliance with this Protocol per the requirements set forth herein and per the City Forest Credits Standard Section 5.2 and Appendix C, Article 6.4 (A6.4-SB008-A11, version 01.0) of the United Nations Climate Change Conference Paris Agreement, and International Standards Organization 14064-3. The Registry retains the third-party VVB, rather than allowing Project Operators to do so, in order to avoid conflicts of interest or situations where the financial interests of the VVB are aligned with the Project rather than with the standards body. Specifically, the Registry adopts and utilizes the following standards from ISO 14064-3:

- Upon receiving a completed Project Design Document with data on eligibility, quantification of carbon, and a request for credits, the Registry will retain a VVB to verify the project's compliance with this Protocol. The Registry will be independent of specific project activities. Accreditation requirements for VVBs consistent with Article 6.4 of the UNCCC Paris Agreement are outlined in the City Forest Credits Standard Section 5.2 and Standard Appendix C.
- Verification by a VVB is described in more detail below. Urban forest projects, unlike many other types of carbon offset projects, will be conducted in and around urban areas, by definition. The trees in urban forest projects will be visible to residents of that urban area and to anyone who cares to examine project trees.
- The Registry will maintain independence from the activities of projects and will treat all projects equally with regard to verification.
- The Registry requires a reasonable level of assurance in the accuracy the asserted GHG removals.
- The verification items identified in Appendix D are all material elements, and any asserted GHG removals must be free of material errors, misstatements, or omissions regarding those elements.
- The Registry will record, store, and track all quantification and verification data and either display it for public review or make it available for public review upon request.

- The Registry will follow a process for follow-up and maintenance for consistency and continuity. This process will consist of a validation by the Registry to ensure that the Verification Report for each Project is consistent with the project documents submitted by the Project Operator.

More information about the Verification Report is in Appendix D to the Protocol.