

path **finder** user guide

Welcome to Pathfinder 3.2!

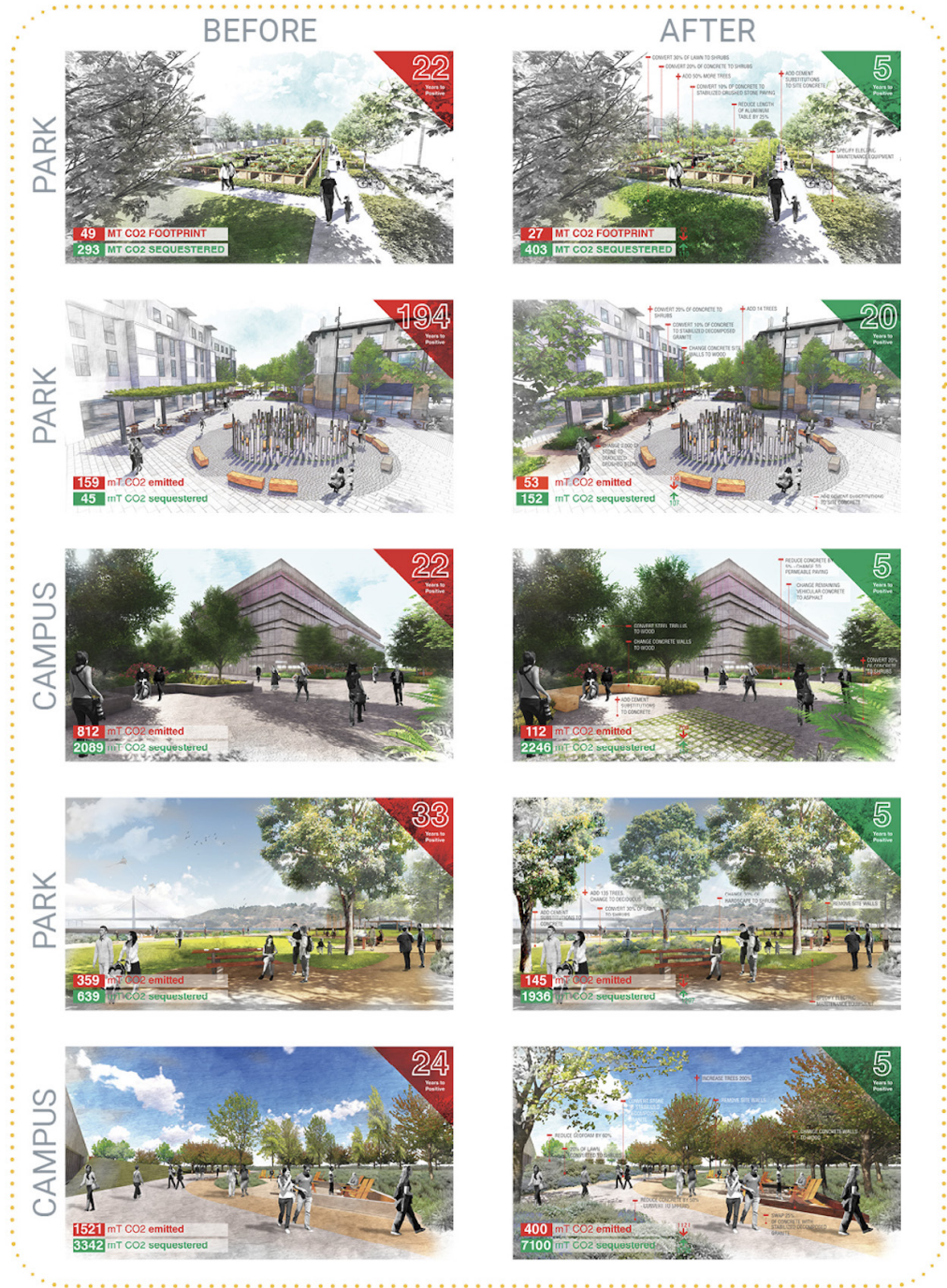
This is your guide to:

1. Understand how to meet the Climate Positive Design Challenge
2. Learn about related tools and suggested use
3. Explore each step and feature in Pathfinder

Let's get started



Targets are based on a 2019 industry study by CPD which assessed project improvement potential.



Use **Pathfinder** to meet the Climate Positive Design Challenge targets.

The **Climate Positive Design Challenge** is a voluntary industry program managed by Climate Positive Design that reports progress on meeting the UNFCCC Paris Agreement and IPCC 1.5°C Special Report goals.

The Challenge tracks emissions reductions and sequestration increases on projects in the exterior built and natural environment logged in the **Pathfinder** application. Established in 2019, the program set the following targets for how many years each project type would strive to offset its own emissions:



years to
climate positive design

5

parks, gardens,
campus, etc.

20

plazas and
streetscapes

25

infrastructure

For a complete list of project types see: <https://climatepositivedesign.org/advocacy/>

set your goals

Carbon Conscience > Climate Positive Design Roadmap

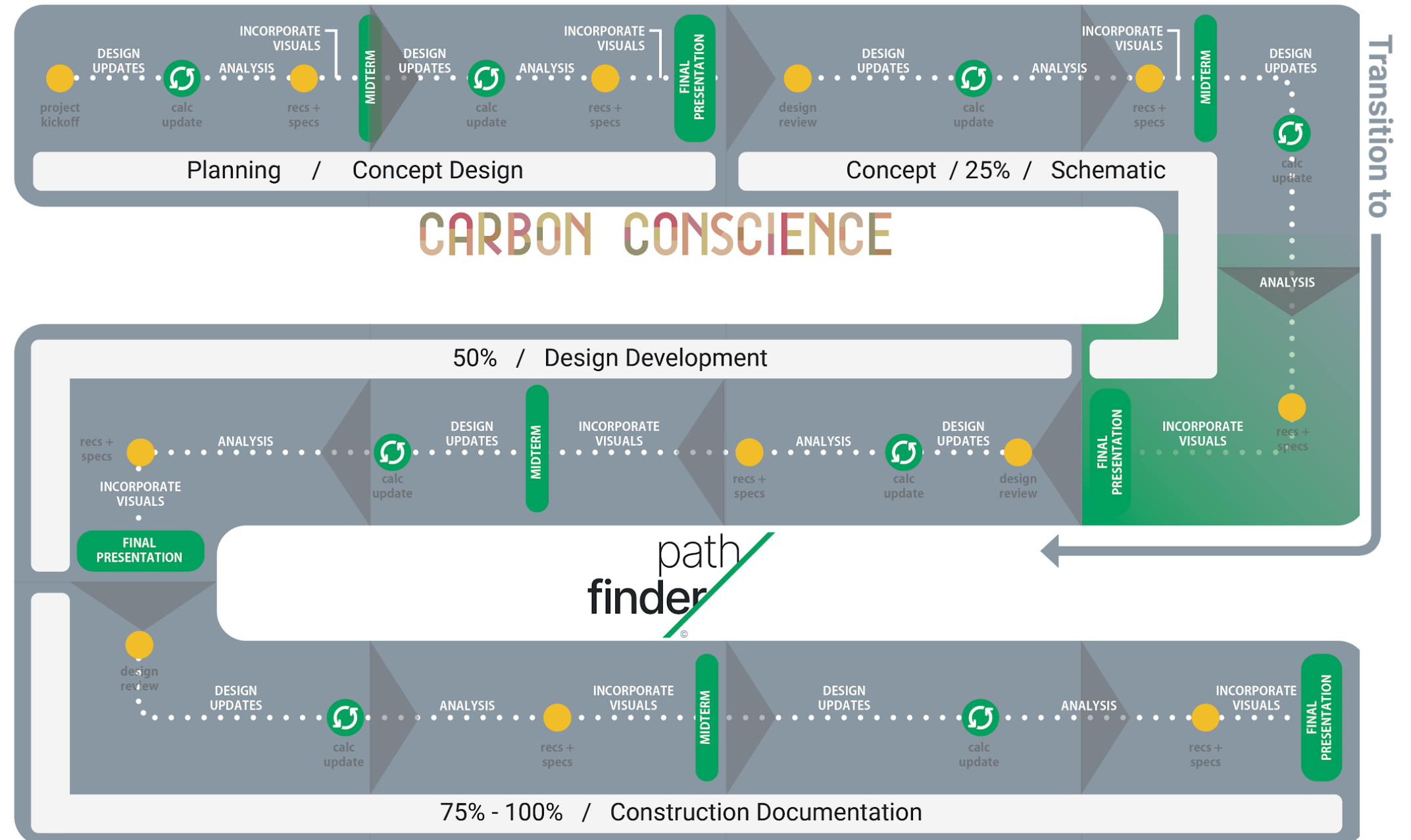
If your project is in an early master planning stage, consider starting your analysis in Carbon Conscience before transitioning into Pathfinder.

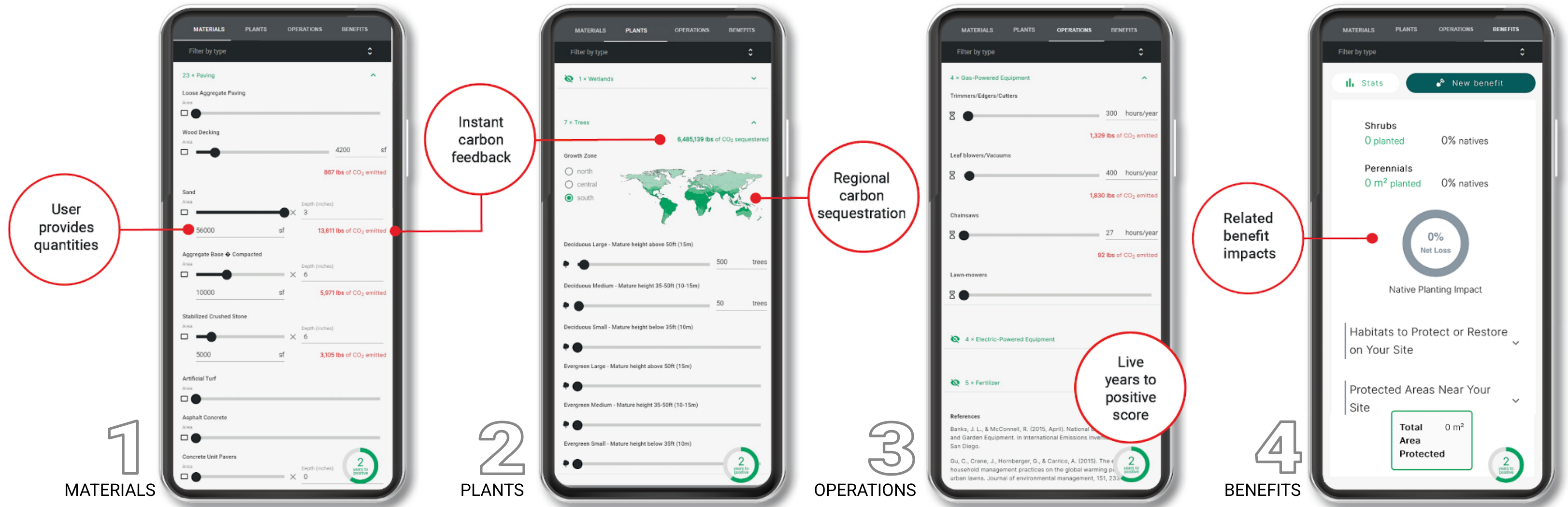
[Carbon Conscience](#) is an application for evaluating potential carbon impacts of urban design when quantity takeoffs are not yet available.

If your project concept already has general quantities, you can begin in Pathfinder.

[Pathfinder](#) aligns with the Carbon Conscience dataset, and is meant to be used from Concept (25% Design) through Construction Documentation (100% Design).

Use Pathfinder during each phase of design to set project goals, test design ideas, iterate, refine and measure the final project impacts.





Pathfinder is a free, accessible, life-cycle assessment (LCA) tool for landscape architects, designers, planners, and engineers to calculate the greenhouse gas emissions, carbon sequestration and related benefits associated with exterior built environment projects.

how pathfinder works

Click
here!

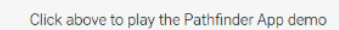
Use Pathfinder

First Name*

Last Name*

Email*

[Sign Up For Notifications](#)



begin using pathfinder

Enter the project location

1

Search for a location

Draw your site boundary

9,877 m2

3

Click each boundary point of your site and close the polygon

Area calculated from boundary

9,877 m2

Do you have a more accurate figure available? Enter it below:

Confirm Project Area below. Adjust area as needed for accuracy and provide footprint of any buildings within Project Area.

Project Area	Units
9877.64	m2

Building Footprint	Units
Project area	Units
200	m2

Site Area	Units
9677.64	m2

← Redraw boundary

Continue with existing value →

5

Approve mapped Project Area or adjust to specific quantity and add any proposed Building Footprints to establish Site Area

4

Check the circle to advance

Click the polygon button to define your site boundary

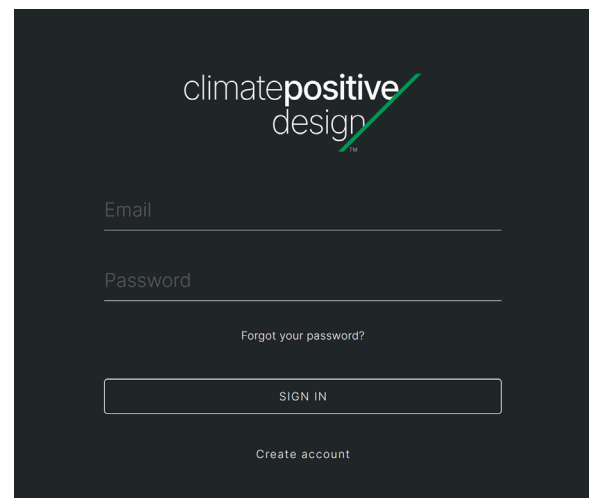
2



mapbox

Enter an address or location to find your site. Click the polygon button to draw the boundary of your site. When complete, click the checkmark and adjust the area and units as needed within the pop-up window as described above to establish your Site Area. Once set, click **Continue with existing value**.

define your site boundary



climatepositive
design

Email

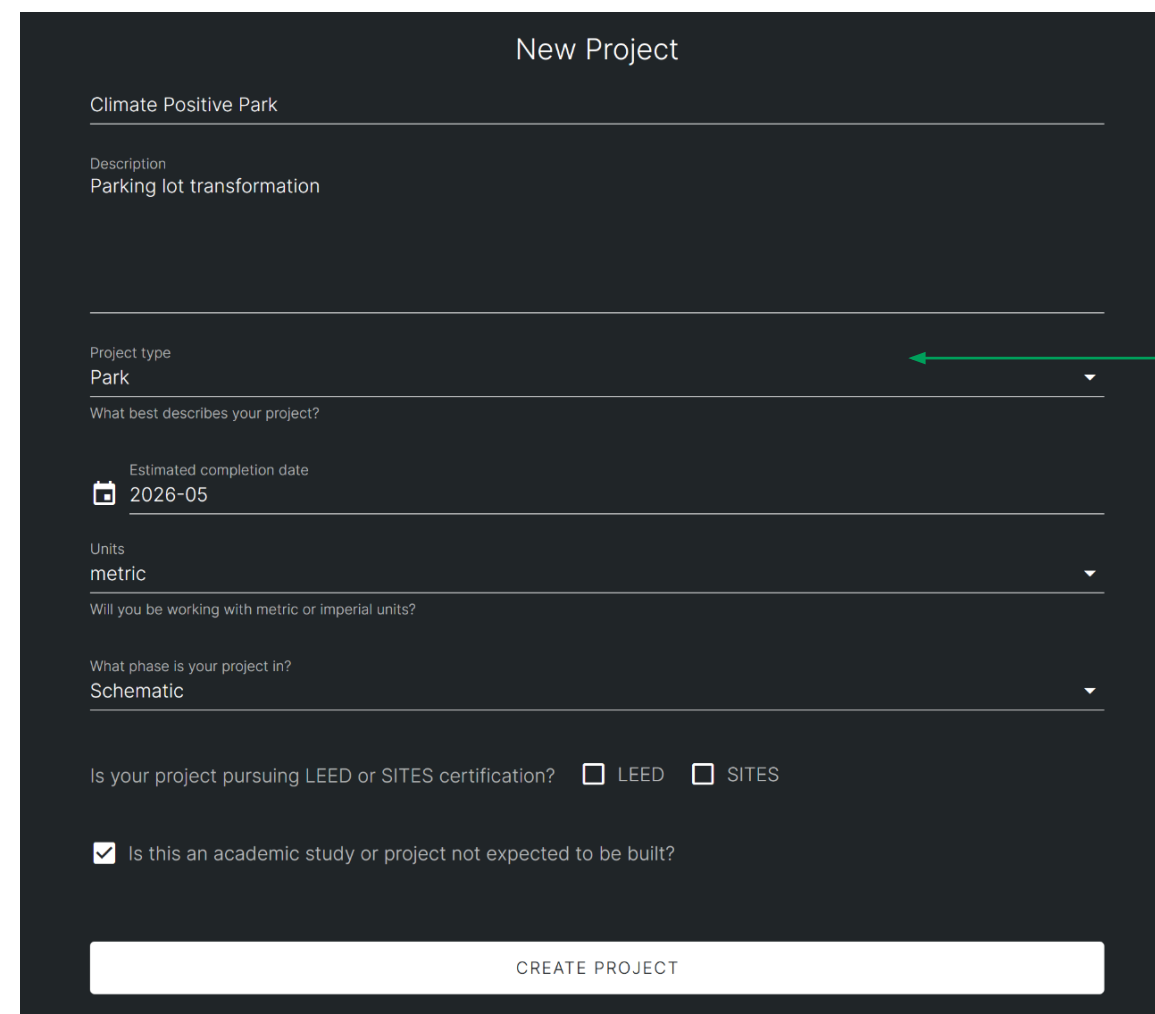
Password

[Forgot your password?](#)

[SIGN IN](#)

[Create account](#)

Sign in or create an account.

New Project

Climate Positive Park

Description
Parking lot transformation

Project type
Park

What best describes your project?

Estimated completion date
2026-05

Units
metric

Will you be working with metric or imperial units?

What phase is your project in?
Schematic

Is your project pursuing LEED or SITES certification? ☐ LEED ☐ SITES

☒ Is this an academic study or project not expected to be built?

[CREATE PROJECT](#)

Project Type: Select the site or infrastructure option that best describes your project:

- Bridge
- Campus
- Ecosystem Preservation
- Energy Distribution
- Garden
- Green Roof
- Hospitality
- Maritime/Port
- Mixed Development
- Park
- Plaza
- Residential
- Road
- Runway
- Streetscape
- Tunnel
- Other: Infrastructure
- Other: Site

Name and describe your project, select the Project Type, estimated completion date, units, and current design phase.

Select any certification pursued, and remember to check the academic study box if the project is not currently expected to be built, so that the data is not included in aggregated global exterior built environment projections.

set up your account and project

Click here to change project name or description

Click here to change your project image

Duplicate any Baseline or Design version to modify elements and compare.

Click to change to Design Alternative, Baseline, or to make primary version.

Select these buttons to adjust project information, redraw site boundaries, etc.

Add existing biodiversity site conditions info.

Site data, see Benefits for more info.

CLIMATE POSITIVE PARK

Forest park with trails and native plantings



Project Information

Park June 2026 imperial units 9.262 acres Design Development

Site Geolocation Data

+ Add Biodiversity Site Conditions

Northeast US Coastal forests (Temperate Broadleaf & Mixed Forests) Annual Potential ETo: 51.69 in

Refresh Project Conditions

Versions

- Baseline Baseline Design

Last modified 26th September 2025

No description

+ Add detail Primary baseline View scorecard
- Design Alternative - 50% Emissions Reduction Design Alternative

Last modified 26th September 2025

No description

+ Add detail Primary design View scorecard
- Design Alternative - 50% Sequestration Increase Design Alternative

Last modified 26th September 2025

No description

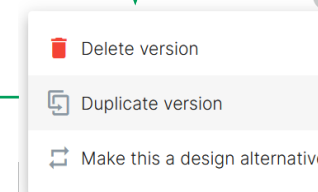
+ Add detail Make primary design View scorecard
- Design Alt - 50% Emissions Reduction & 100% Sequestration Increase Design Alternative

Last modified 26th September 2025

No description

+ Add detail Make primary design View scorecard

Create new version



Establish one Baseline Design alternative as Primary for comparison to the Primary Design Alternative on the scorecard

Establish one Design Alternative as Primary

View scorecard at any time

Add and update elements

Create new version of your project, whether Baseline or Design Alternative

review your project page

In the Materials tab, search for or select material categories and subcategories.

1

Select each material that is part of the design.

2

4

Create custom elements for your project as needed. See next page for more information.

3

Pathfinder will suggest related elements. Select all that will be included in the design.

Pathfinder Materials

Search for materials

Category

Search or select a category to load available materials
The materials will be sorted from least to most emissions.

Can't find what you're looking for?

Create a custom material

Looking for an EPD?

Search EC3 Database

1

If you'd like to add a specific material, or an assembly detailed in your project, create a custom material.

Enter the GWP kgCO₂e per unit. This can be found on the product EPD.

2

Note: If you're creating an assembly, sum the GWP of all constituent parts, per the unit measured.

New custom material

Name
Custom Low-Carbon Concrete Mix

Category
Concrete Hardscape

CO₂e per unit
218 kgCO₂e per

Element measured by
length x width x height

Select up to 3 dimension sets

Cancel

m

m2

ha

m3

kg

tonne

3

Select the unit of measurement. See EPD at right.

An Environmental Product Declaration (EPD) contains information about the environmental performance or impact of any product or material over its lifetime. Search for EPDs on [EC3](#) and other EPD databases.

Company Name
Environmental Product Declaration
Mix - Plant

This Environmental Product Declaration (EPD) reports the impacts for 1 m³ of ready mixed concrete mix, meeting the following specifications:

- ASTM C94: Ready-Mixed Concrete
- UNSPSC Code 30111505: Ready Mix Concrete
- CSI Section 03 30 00: Cast-in-Place Concrete

COMPANY
Company name
Address

PLANT
Plant name
Address

EPD PROGRAM OPERATOR
EPD Operator name
Address

DATE OF ISSUE
02/26/2019 (valid for 5 years until 02/26/2024)

ENVIRONMENTAL IMPACTS

Declared Product:
Mix 604
6.0SK 3/4 RECYCLED AD
Compressive strength: 4000 psi at 28 days

Declared Unit: 1 m³ of concrete

Global Warming Potential (kg CO ₂ -eq)	355
Ozone Depletion Potential (kg CFC-11-eq)	9.6E-6
Acidification Potential (kg SO ₂ -eq)	1.24
Eutrophication Potential (kg N-eq)	0.44
Photochemical Smog Creation Potential (kg O ₃ -eq)	26.3
Total Primary Energy Consumption (MJ)	2,436
Nonrenewable (MJ)	2,327
Renewable (MJ)	109
Total Concrete Water Consumption (m ³)	1.80
Batching Water (m ³)	0.08
Washing Water (m ³)	0.02
Nonrenewable Material Resource Consumption (kg)	1,855
Renewable Material Resource Consumption (kg)	2.44
Hazardous Waste Production (kg)	0.02
Nonhazardous Waste Production (kg)	3.28

Product Components: crushed aggregate (ASTM C33), , natural aggregate (ASTM C33), Portland cement (ASTM C150), fly ash (ASTM C618), batch water (ASTM C1602), admixture (ASTM C494)

Unit
GWP

Pathfinder Materials

Search for materials

Category

Search or select a category to load available materials
The materials will be sorted from least to most emissions.

Can't find what you're looking for? [Create a custom material](#)

Looking for an EPD? [Search EC3 Database](#)

1 If you need to find an EPD or GWP data for a material or product, **Search** the EC3 Database

EC3 Database Search

Location Country or Region
United States of America - California

Category
Concrete

Subcategory
ReadyMix
Shotcrete
CementGrout
FlowableFill
Precast

Cancel

2 Add Location (optional), Category and Subcategory

EC3 Database Search

Location Country or Region
United States of America - California

Category
Concrete

Subcategory
ReadyMix

Search Options

> Compressive Strength mPa Curing Time ...

Options

☐ Air Entrained

☐ CO2 Cured

☐ SCC

☐ Fiber Reinforced

☐ Lightweight

Cancel

3 Click on the **Search Options** to see additional search parameters available for the material type

EC3 Database Search

Location Country or Region
United States of America - California

Category
Concrete

Subcategory
ReadyMix

Search Options

> Compressive Strength mPa Curing Time ...

Options

> uaGWP (kgCO2e) / 1m

Advanced Options

Search EC3

Cancel

4 Once complete, click **Search EC3**

EC3 Database Search

Location Country or Region
United States of America - California

Category
Concrete

Subcategory
ReadyMix

Search Options

Search EC3

Results

Product EPDs: 19,134.00
Industry EPDs: 0.00
Achievable: 287.39 kgCO₂e
Average: 363.17 kgCO₂e
Conservative: 434.55 kgCO₂e
Unit: 1 m³

Search for specific EPD Apply to custom material

Cancel

5 Results are returned from EC3

6 Either apply these results to a custom material or search for a specific EPD. More information on the next page.

create custom elements - EC3

EC3 Database Search

Location: Country or Region
United States of America - California

Category: Concrete

Subcategory: ReadyMix

Search Options

Search EC3

Results

Product EPDs: 19,134.00
Industry EPDs: 0.00
Achievable: 287.39 kgCO₂e
Average: 363.17 kgCO₂e
Conservative: 434.55 kgCO₂e
Unit: 1 m³

Search for specific EPD Apply to custom material

Cancel

1 If you search for a specific EPD, then you'll be able to select from a range of available EPDs and apply them directly to your custom material.

Search for specific EPD

Name	Manufacturer	Description	Declaration Type	uaGWP (kgCO ₂ e)
3154CC	Irving Materials Inc.	3000 N/A GRAVEL	Product EPD	202.3
50C50LIE-2PQ	Upstone Materials	5000 PSI Exterior	Product EPD	3871
53434	CalPortland	-	Product EPD	225.7
61883	CalPortland	-	Product EPD	386.2
0932	CalPortland	5000	Product EPD	354.4
0766	CalPortland	5000PSI - AEA CITY PT	Product EPD	449.7
30-1114_IL_40SL_Arg	Vulcan Materials Company	3000 PSI VDOT A3	Product EPD	224.6
30-1114_IL_40SL	Vulcan Materials Company	3000 PSI VDOT A3	Product EPD	215.6
30-1114_IL_40SL_San	Vulcan Materials Company	3000PSI VDOT A3 GENERAL	Product EPD	219.9
4068RR	HC & D	4000 PSI - 3/4"	Product EPD	420.1
1617181	CEMEX	Ready-mixed concrete for business-to-business communication meeting ASTM C94, UNSPSC, CSA, and CSI standards with various concrete mixes and compressive strengths	Product EPD	268.0
61835V	CalPortland	-	Product EPD	269.6
60918	CalPortland	-	Product EPD	292.9
60953H	CalPortland	-	Product EPD	381.6
63335	CalPortland	-	Product EPD	369.5

Back Create Element

2 Select an EPD and then click **Create Element**

Concrete - Ready Mix - Custom

Name: O50D8

Description:
ORCA 1/2" 5000 PSI .50 W/C 8" ADVA

Manufacturer: CalPortland

EC3 Category: Concrete / ReadyMix

Impact type: once, during construction

Uncertainty Adjusted Global Warming Potential (uaGWP)
275.12 kgCO₂e per m3

Source
Click here: Environmental Production Declaration

Building Transparency - EC3
<https://buildingtransparency.org/ec3>

New EC3-based Custom Material

Name
Concrete - Ready Mix - Custom

Category
Aggregate & Asphalt Hardscape

Brick & Stone Hardscape

Concrete Hardscape

Demolition & Site Preparation

Exterior Lighting

Furnishings

Cancel Back Create Element

New EC3-based Custom Material

Name
Concrete - Ready Mix - Custom

Category
Concrete Hardscape

EC3 UA GWP kgCO₂e per unit

363.17 kgCO₂e per m3 : Average

287.39 kgCO₂e per m3 : Achievable

434.55 kgCO₂e per m3 : Conservative

Additional Notes

Cancel Back Create Element

New EC3-based Custom Material

Name
Concrete - Ready Mix - Custom

Category
Concrete Hardscape

EC3 UA GWP kgCO₂e per unit

287.39 kgCO₂e per m3 : Achievable

Element measured by

☐ length x width x height

☐ length x width x depth

☐ length x width x thickness

☒ area x depth

☐ volume

3 Once the EPD is selected or results are applied directly to a custom material, then name the material, place it within a Pathfinder Category, select which Uncertainty Adjusted Global Warming Potential (uaGWP) value is preferred, and determine the dimensions needed. Once complete, click **Create Element**.

4 Then the custom material is complete. Click on the book icon for additional information.

Concrete - Ready Mix (Custom)

Transportation Option
Assume 100% Truck (Typical)

Transportation Distance
Intermediate Local (within 80km or 50mi radius fr

Replacement Over 60 YRS.
0

Volume
0 ft³

0 kgCO₂e

Adjust the transportation type and distance to project site here.

create custom elements - EC3

Total emissions from materials,
including transportation, installation/
construction and replacements

The screenshot displays the Pathfinder software interface with a dark header bar containing tabs: MATERIALS, PLANTS, OPERATIONS, and BENEFITS. Below the header, a summary section shows 'Total material impact: 192,597 kgCO₂e'. The main content area is divided into three sections: 'Concrete Hardscape', 'Reinforcement for CIP Concrete Paving', and 'Aggregate & Asphalt Hardscape'. Each section contains input fields for 'Transportation Option' (Assume 100% Truck (Typical)), 'Transportation Distance' (Hyper-Local (16km or 10mi radius from site)), 'Material' (Concrete (1:2:4, type 1 or 2, 3000-4000psi) (Typical)), 'Replacement Over 60 YRS.' (1), 'Area' (1000 m²), and 'Depth' (120 mm). The 'Concrete Hardscape' section also shows a 'Switch dimensions' button and a 'Details and information' icon. The 'Reinforcement for CIP Concrete Paving' section includes 'Rebar Diameter' (13 mm) and 'Rebar Spacing (O.C.E.W.)' (200 mm). The 'Aggregate & Asphalt Hardscape' section shows 'Material' (Aggregate Base (Crushed) (Typical)) and 'Replacement Over 60 YRS.' (0). The 'Area' and 'Depth' sliders are visible for each section. The total emissions for each section are displayed in red: 133,818 kgCO₂e for Concrete Hardscape, 51,552 kgCO₂e for Reinforcement, and 7,227 kgCO₂e for Aggregate & Asphalt. A 'Design suggestions' button is at the bottom.

Switch between Materials, Plants, Operations
and Benefits at any time.

View or add internal reference notes to
your element as needed.

Details and information

Options

Emissions of the element, including
transportation, installation and
replacements.

keep adding materials

Select type of transportation of the element to the site

Select material type

Enter dimensions / quantity and units

Click for climate positive design suggestions

The screenshot shows the 'MATERIALS' tab in the Pathfinder application. At the top, it displays 'Total material impact: 192,597 kgCO₂e'. Below this, there are three sections for adding materials:

- Concrete Hardscape**: Includes 'Cast-in-Place Concrete Paving'. It has a 'Transportation Option' dropdown set to 'Assume 100% Truck (Typical)', a 'Transportation Distance' dropdown set to 'Hyper-Local (16km or 10mi radius from site)', a 'Material' dropdown set to 'Concrete (1:2:4, type 1 or 2, 3000-4000psi) (Typical)', and a 'Replacement Over 60 YRS.' dropdown set to '1'. It features sliders for 'Area' (set to 1000 m²) and 'Depth' (set to 120 mm), resulting in a total impact of 133,818 kgCO₂e.
- Reinforcement for CIP Concrete Paving**: Includes 'Reinforcement for CIP Concrete Paving'. It has a 'Transportation Option' dropdown set to 'Assume 100% Truck (Typical)', a 'Transportation Distance' dropdown set to 'Local (160km or 100mi radius from site)', a 'Material' dropdown set to 'Steel (Primary Steel in BF-BOF (up to 30% recycled))', and a 'Replacement Over 60 YRS.' dropdown set to '1'. It features sliders for 'Area' (set to 1000 m²), 'Rebar Diameter' (set to 13 mm), and 'Rebar Spacing (O.C.E.W.)' (set to 200 mm), resulting in a total impact of 51,552 kgCO₂e.
- Aggregate & Asphalt Hardscape**: Includes 'Compacted Aggregate Base'. It has a 'Transportation Option' dropdown set to 'Assume 100% Truck (Typical)', a 'Transportation Distance' dropdown set to 'Hyper-Local (16km or 10mi radius from site)', a 'Material' dropdown set to 'Aggregate Base (Crushed) (Typical)', and a 'Replacement Over 60 YRS.' dropdown set to '0'. It features sliders for 'Area' (set to 1000 m²) and 'Depth' (set to 150 mm), resulting in a total impact of 7,227 kgCO₂e.

At the bottom of the interface, there is a 'Design suggestions' button with a lightbulb icon.

4 Switch dimension type as needed, i.e. length X width X height vs area X depth vs volume.

5 Choose the distance that the material will be transported to the site.

6 Enter the number of expected replacements of the element over the 60-year life of the project.

Materials can be added multiple times as different elements, with different dimensions and variables. For example, add a 4" slab of type 1 concrete and a 5" slab. Or add the total volume of type 1 concrete.

keep adding materials

Assemblies are pre-assembled groupings of materials within a unified system or section which is organized by subcategories. Every material within the Assembly is optional, so only use what is needed for your project.

The emissions from each material are aggregated at the bottom of the Assembly and then displayed as a single entry on the second page of the scorecard.

Pathfinder Materials

Search for materials

Concrete Hardscape

Paving & Slabs

Cast-in-Place Concrete Paving

Cast-in-Place Concrete Paving (A)

Cast-in-Place Concrete Paving (AUS)

Cast-in-Place Concrete Stairs

Cast-in-Place Concrete Subslab

Cast-in-Place Pervious Concrete Paving

Can't find what you're looking for?

Create a custom material

Looking for an EPD?

Search EC3 Database

1 Assemblies can be identified by the "(A)"

Concrete Hardscape

Cast-in-Place Concrete Paving (A) PAVE01

Surface Material

Cast-in-Place Concrete Paving

Transportation Option

Assume 100% Truck (Typical)

Transportation Distance

Intermediate Local (within 80km or 50mi radius)

Material

Concrete (1:2:4, Type 1 or 2, 3000-4000psi) (Ty

Replacement Over 60 YRS.

1

Area

100

sf

Depth

4

in

1,196 kgCO₂e

Reinforcement

Welded Wire Mesh (Fabric) Reinforcement

Transportation Option

Assume 100% Truck (Typical)

Transportation Distance

Regional (within 800km or 500mi radius from sit

Material

Steel (Primary Steel in BF-BOF (up to 30% recyc

Replacement Over 60 YRS.

1

Area

99

sf

Mesh Diameter

0.1875

in

Mesh Spacing

4

in

143 kgCO₂e

Reinforcement for CIP Concrete Paving

Transportation Option

Assume 100% Truck (Typical)

Transportation Distance

Regional (within 800km or 500mi radius from sit

Material

Steel (Primary Steel in BF-BOF (up to 30% recyc

Replacement Over 60 YRS.

1

Area

0

sf

Rebar Diameter

0

in

Rebar Spacing (O.C.E.W.)

0

in

0 kgCO₂e

Subbase Material

Compacted Aggregate Base

Transportation Option

Assume 100% Truck (Typical)

Transportation Distance

Local (within 160km or 100mi radius from site)

Material

Aggregate Base (Crushed) (Typical)

Replacement Over 60 YRS.

0

Area

101

sf

Depth

6

in

406 kgCO₂e

Total Emissions: 1,745 kgCO₂e

2 Assembly name

3 Enter custom project assembly ID if desired (6-digit max)

Scorecard Results

6

4 Assembly subcategory name

5 Total assembly impact

Embodied Carbon Emissions	
Concrete Hardscape	
Cast-in-Place Concrete Paving (A) (PAVE01)	1,745 kgCO ₂ e
Subtotal	1,745 kgCO₂e
Total Embodied Carbon	1,745 kgCO₂e

keep adding materials - Assemblies

Project statistics are updated here.
Click to view scorecard.

1

Select each planting category and element, including Trees and Ecosystems to protect and restore, Perennials, Shrubs, Lawn and Green Infrastructure.

2

Select transportation type and distance. Select type of nursery stock specified. Enter area or quantity of plants.

3

Click for climate positive design suggestions.

8

add plants

The screenshot displays the Pathfinder Plants interface with the following sections:

- Version Stats:** Shows project carbon sequestration statistics, including a scorecard link.
- Pathfinder Plants:** A sidebar menu for selecting planting categories like Ecosystems, Trees, and Perennials.
- Ecosystems - Existing To Protect:** A section for configuring existing ecosystems with sliders for area and carbon impact.
- Ecosystem Restoration:** A section for configuring restoration targets, including transportation options and nursery stock.
- Trees:** A section for configuring tree planting, including transportation options and nursery stock.
- Perennials / Perennial Grasses:** A section for configuring perennial plantings, including transportation options and nursery stock.

Total emissions and sequestration from plants, including nursery emissions, transportation, installation/construction and replacements.

4

Select the Growing Season Duration zone of your site. Click to enlarge the map.

5

Add the area of each existing habitat to be protected, or to be restored, from the UN FAO ecosystem types.

6

Ecosystem Restoration Target Condition:

- Good closely mimics a native ecosystem in structural and functional diversity, species mix and spacing.
- Moderate somewhat mimics the native ecosystem.

7

Select the percentage of all plants of this type that are native.



Pathfinder calculates the number of years until the plant sequestration offsets the emissions of the project. The target Years to Positive depends on the project type, see the [Climate Positive Design Challenge](#).

Total emissions from operations over the 60-year life of the project.

Select Operations category and element.

1

Version Stats

Your project will sequester **292 tonnes** more carbon than it emits in its estimated lifespan

Your project is expected to reach climate positive in **17** years, in **2043**.

Your positive score is in the **lower 49th** percentile of projects in our database.

View scorecard

Pathfinder Operations

Search for operations

- Landscape Water Use
- Maintenance Equipment
- Soil Amendments & Mulch

MATERIALS

PLANTS

OPERATIONS

BENEFITS

Total operational impact:

118,477 kgCO₂e

Maintenance Equipment

Electric Leaf Blowers / Vacuums

Power

120 watts

Hours Used Annually

200 hours

957 kgCO₂e

Landscape Water Use

Moderate Water Use

Planting Type

Trees

Irrigation Type

Drip Irrigation - Pressure Compensated

Area

500 m²

34,780 kgCO₂e

28,983,333 L

Low Water Use

Planting Type

Groundcover

Irrigation Type

Micro Spray Irrigation

Area

2000 m²

71,547 kgCO₂e

59,622,857 L

Soil Amendments & Mulch

Number Of Fertilizer Applications In 1st Year

10

Annual Fertilizer Application Frequency After 1st Year

2

NPK Fertilizer Application

N per area

0.2 kg/sf

P per area

0.06 kg/sf

K per area

0.06 kg/sf

Application area

5000 m²

11,193 kgCO₂e

Design suggestions

2

Enter power and annual usage of maintenance equipment.

3

Create an element for each hydrozone in the project. Select plant and irrigation type. Pathfinder calculates the projected water used over the 60-year life of the project, and the emissions of that water.

4

See Benefits - Water for further information about water use.

5

Add expected fertilizer frequency, quantity and contents.

6

Click for climate positive design suggestions.

add operations

18

Design Suggestion categories

1

Design Alternatives for Materials
shown here by Category/Sub-Cat

2

Element in project shown here
along with material specified in ()

3

Alternative material options listed
here sorted by carbon impact

4

Click here to see additional
alternatives

5

6

Carbon emissions from specific
Material element shown here

7

Alternative Elements or Assemblies listed
here, sorted by carbon impact.

8

Click here to add an alternative
option to your project

design suggestions

Climate Positive Park

Design Alternative - 50% Sequestration Increase

Design suggestions

Improve your project's carbon impact

Consider these alternatives:

Add more trees, protected and restored ecosystems
Design multi-layered planting based on local native habitats to increase sequestration and biodiversity.

Plants
Maximize native tree planting to enhance carbon sequestration and biodiversity

Protect and restore native ecosystems
Design plant communities based on habitats native to the site's ecoregion, mimicking the mix of species, functional and structural diversity.

Operations - Gas Powered Equipment
Switch to electric or hand-powered equipment
Less fossil fuel required

Concrete Hardscape - Paving & Slabs

Elements in project
Highest to lowest carbon emissions per unit

Cast-in-Place Concrete Paving
(Concrete 1:2:4, Type 1 or 2, 3000-4000psi) (Typical - no SCM)

Emissions in project: 3,589 kgCO₂e

Alternative Materials to Consider
Lowest to highest carbon emissions per unit

Salvaged Concrete Paving - Reset

Clay Brick (Air/Sun Dried)

Asphaltic Concrete (WMA, 40% RAP)

Asphaltic Concrete (WMA) - Superpave

Asphaltic Concrete (HMA, 40% RAP)

Show 10 more

Alternative Elements and Assemblies to Consider
Lowest to highest impact

Gravel Paving

Crushed Stone Paving (Decomposed Granite)

Decking

Salvaged Concrete Paving

Stabilized Crushed Stone Paving - 4" (100mm) Depth

Show 13 more

Access the Biodiversity Site Conditions - Existing form from the Project or Benefits: Biodiversity page. May be edited at any time, but only one form is applied to all versions of the project.

Enter areas of existing ecosystems on site, from the [UN FAO Global Ecological Zones](#) classification.

Add existing general landscape planting including shrubs, groundcovers, perennials, annuals, etc., and indicate the percentage of all existing plants that are native to the site's ecoregion (see Benefits tab, Biodiversity).

Add turf lawn areas, selecting which type of management the turf receives, and indicate the percentage of turf that is native.

Add existing trees of each size and type, and indicate the percentage of each that is native.

add biodiversity site conditions: existing

Biodiversity Site Conditions - Pre-construction

Project Area: 9,877 sq metres

Enter the following pre-construction site information, by: ☒ Area ☐ Percentage

Hardscape and Buildings: 5877 m²

☒ Ecosystem ☐ General

	Area	Condition
☐ Boreal Forest	0 m²	☐ G ☐ M ☐ P
☐ Dry Forest (Mediterranean)	0 m²	☐ G ☐ M ☐ P
☐ Dry Meadows	0 m²	☐ G ☐ M ☐ P
☐ Forested or Shrubby Peat Swamp	0 m²	☐ G ☐ M ☐ P
☐ Mangrove Forest	0 m²	☐ G ☐ M ☐ P
☐ Prairie Grassland	0 m²	☐ G ☐ M ☐ P
☐ Subtropical Humid Forest	0 m²	☐ G ☐ M ☐ P
☐ Temperate Continental Forest	0 m²	☐ G ☐ M ☐ P
☒ Tropical Dry Deciduous	2000 m²	☒ G ☐ M ☐ P
☒ Tropical Moist Deciduous	1000 m²	☐ G ☒ M ☐ P
☐ Temperate Oceanic Rainforest	0 m²	☐ G ☐ M ☐ P
☐ Tropical Rainforest	0 m²	☐ G ☐ M ☐ P
☐ Tropical Shrublands	0 m²	☐ G ☐ M ☐ P
☐ Temperate Wetland and Salt Marsh	0 m²	☐ G ☐ M ☐ P

☒ General ☐ Lawn

	Area	% Native
☒ General Planting (shrubs, groundcover, etc)	500 m²	20%
☒ High Management	500 m²	0%
☐ Moderate Management	0 m²	%
☐ Low Management	0 m²	%
☐ No-mow	0 m²	%

☒ Trees ☐ % Native

	Quantity	% Native
☒ Deciduous Large	150	50%
☐ Deciduous Medium		%
☐ Deciduous Small		%
☐ Evergreen Large		%
☐ Evergreen Medium		%
☐ Evergreen Small		%

Discard Save

2 Enter pre-demolition and pre-construction existing site condition information, in order to calculate biodiversity impacts for your design.

3 Select whether to enter information in areas, or in percentage of the total site (including building areas).

4 Enter total area of existing hardscape and buildings. All remaining area is considered planting area.

6 Select condition, compared to an optimal, healthy native ecosystem:

- Good (G) is close to optimal
- Moderate (M) shows some impacts
- Poor (P) ecosystem shows heavy impacts of human interference, invasive species, browsing and/or climate change

10 The sum of all areas or percentages entered must equal the Total Site Area

Add existing biodiversity site conditions info to calculate biodiversity impacts.

1

Areas of removed and protected ecosystems are compared.

2

The final quantity and condition of native ecosystems and planting is compared to the existing conditions. Existing ecosystems and trees are given greater weight than new planting. See Methodology Report for further information.

4

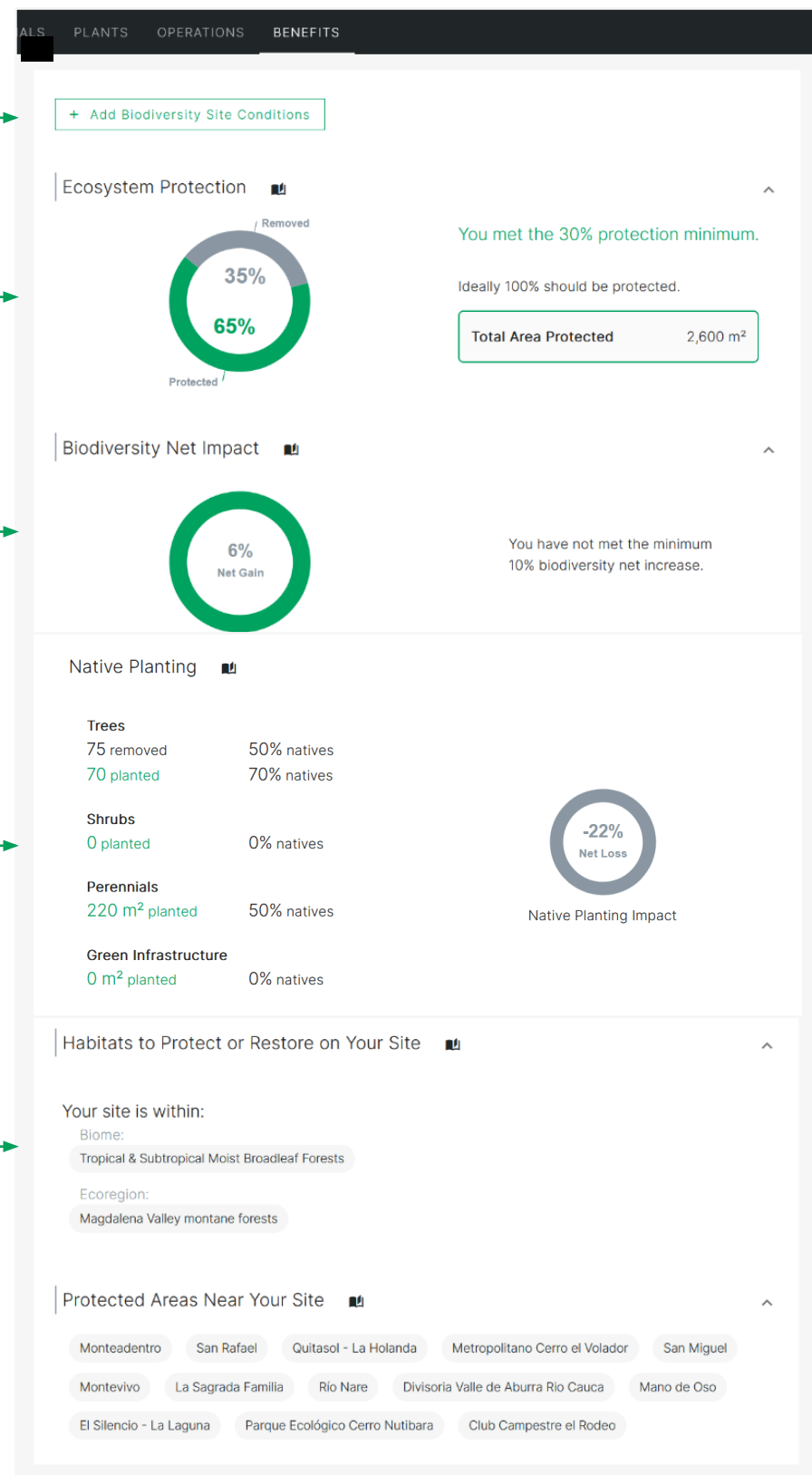
The final quantity of native trees, shrubs and perennials are compared to the existing conditions. Existing native trees are given greater weight than new planting.

6

The project site falls within this biome and ecoregion, according to the [RESOLVE Ecoregions and Biomes](#) map. These can be used to determine native habitats and species.

7

add benefits: biodiversity



3

Per 30x30 goals, protect a minimum of 30% of existing ecosystems. Ideally 100% of good condition native ecosystems should be protected to avoid harming biodiversity.

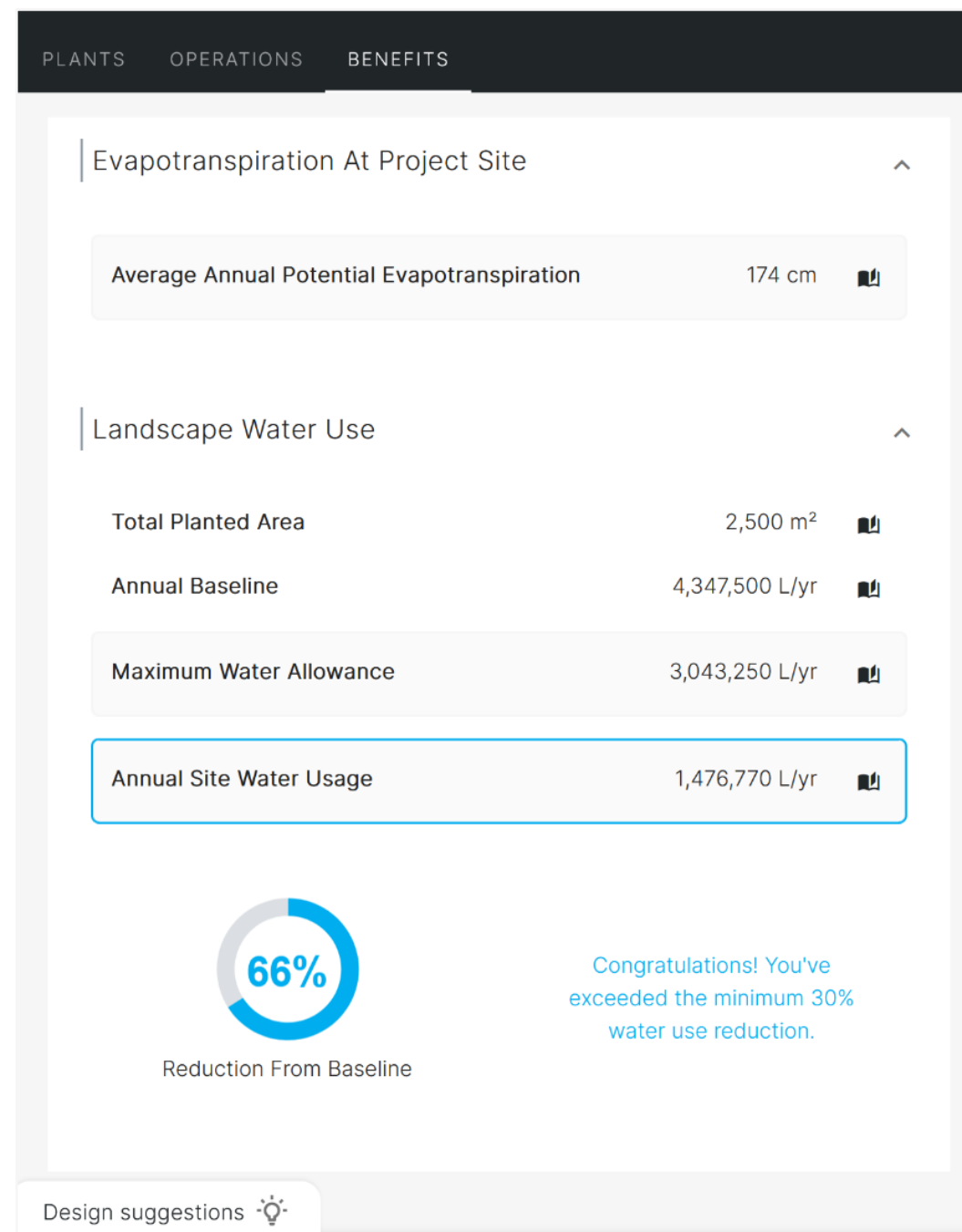
5

Per biodiversity net gain goals, increase biodiversity by at least 10% from the existing site condition.

8

See the [World Database of Protected Areas](#) for protected areas near your site, such as those below within 10 miles (16km). It may be possible to provide habitat for fauna to migrate to your site from nearby protected areas, via wildlife corridors or a patchwork of habitat sites.

1 To calculate annual water usage, add Landscape Water Use elements in Operations, including areas with no irrigation, water features, pools and spas.



2 Potential Evapotranspiration (PET) is the amount of evaporation from land and surfaces, and transpiration from plants that would occur if soil moisture were unlimited. This is used to determine the maximum amount of irrigation water that may be required at a site.

3 Sum of all Landscape Water Use areas added in Operations.

4 Calculated from the site's potential evapotranspiration and the Landscape Water Use elements added in Operations.

5 Reduce water use from the annual baseline by at least 30%, per US EPA WaterSense.

add benefits: water

PLANTSOPERATIONS

BENEFITS

Heat Island (US Only)

The project site is located within a **severe heat zone**.

For the health of site occupants, maximize planted areas, shade with trees and structures, and optimize the solar reflectance of materials to provide up to 10°F (5.7°C) of cooling.

Building Footprint2,000 m²

Site Area448,029.22 m²

Shade

Select the broad biome of the project site:

☐ forestTarget 40-60% urban forest canopy
 ☐ grasslandTarget 20% urban forest canopy
 ☒ desertTarget 15% urban forest canopy

Total Area Shaded By Trees22,695 m²

Total Area of Shade Structures

Area

30000

m²

Only 5% of the site is shaded by trees. Consider adding structures and trees to provide more shade.

Unshaded88%

Structures7%

Trees5%

Choose the broad biome that most closely matches your site area. Tree canopy targets are based upon these broad biomes.

Calculated from all trees entered in Plants tab.

Add more trees to your design in the Plants tab to reach the canopy target.

1

Within the US, sites with a heat measure of 4 or 5 out of 5 per map [Heat Severity - USA 2022](#) are indicated as severe heat areas.

2

Review the Building Footprint, the total area of all buildings on the site in the proposed design. This can be adjusted on the Project Area mapping page.

3

4

6

5

Enter total area of shade structures in the designed landscape, including awnings, arcades, and free-standing structures, soft or rigid.

add benefits: cooling

22

Within the US, the US Government's [Climate and Economic Justice Screening Tool](#) provides environmental, infrastructural, and demographic information about the site area. Overburdened and underserved communities are marginalized by underinvestment and overburdened by pollution.

1

PLANTSOPERATIONS

BENEFITS

Overburdened and Underserved Communities (US Only)

The project is located within an **underserved community**, according to the US Government's Climate and Economic Justice Screening Tool.

☐ Select if your site is located in an underserved community outside the United States, as defined by local authorities.

Community Engagement Spectrum

INCREASING LEVEL OF PUBLIC ENGAGEMENT

INFORM

Provide the public with objective information to assist with understanding problems, alternatives, opportunities and/or solutions.

○

CONSULT

Obtain public feedback on analysis, decisions and/or alternatives.

○

INVOLVE

Work directly with the public to ensure their concerns and aspirations are consistently understood and considered.

○

COLLABORATE

Partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.

●

CO-DESIGN

Place final decision making in the hands of the public.

○

Select highest level of public engagement intended or achieved

If your site is in an underserved community, extra care should be taken to collaborate with and support the local community, throughout the planning and design process.

2

Select if your site falls within an overburdened and underserved community outside the USA, as designated by NGOs, local, national, or international authorities.

3

Adapted from the Spectrum of Public Participation, developed by the [International Association for Public Participation](#).

4

Select the highest level of public engagement intended or achieved during the planning, design and construction process. Ideally projects are designed with greater community engagement (right side of the spectrum), especially when located in overburdened and underserved communities.

add benefits: equity

23

Click View scorecard at any time for updated project results

Net Impact: green text and number means the project will sequester more carbon than emitted over 60 years. Black text and number means the project will emit more carbon than sequestered.

Climate Positive Design Scorecard

Project Name **Climate Positive Park**
Type of Project **Park**

CARBON IMPACT

Net Impact over 60 years

Total Embodied Emissions
Total Biogenic (Sequestration + Emissions)
Total Operational Emissions
Total Carbon Stored

426 Metric Tons

17,922 kgCO₂e
561,720 kgCO₂e
117,521 kgCO₂e
103,962 kgCO₂e

PROJECT AREA

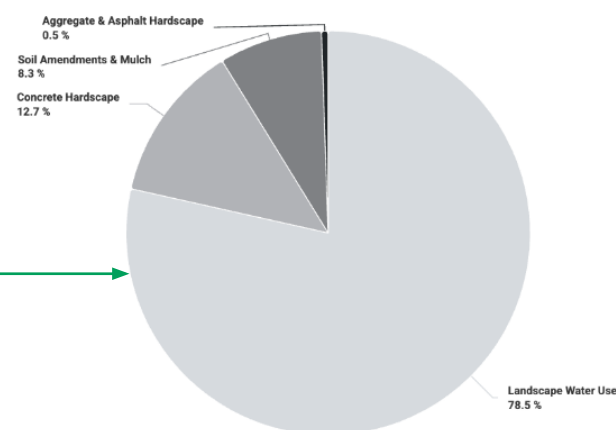
Site Area

Planted Area
Emissions per Area
Sequestration per Area

9,877 m² (0.99 ha)

7,500 m² (76% of total area)
14 kgCO₂e/m²
57 kgCO₂e/m²

Project Emissions



BENEFITS

Biodiversity

65% Existing Native Ecosystem Preserved
31% Biodiversity Net Impact

Water

66% Water Use Reduction from Baseline

IMPROVEMENTS

From Baseline Project: Business As Usual
100% Total Emissions Reduction
23% Total Sequestration Increase

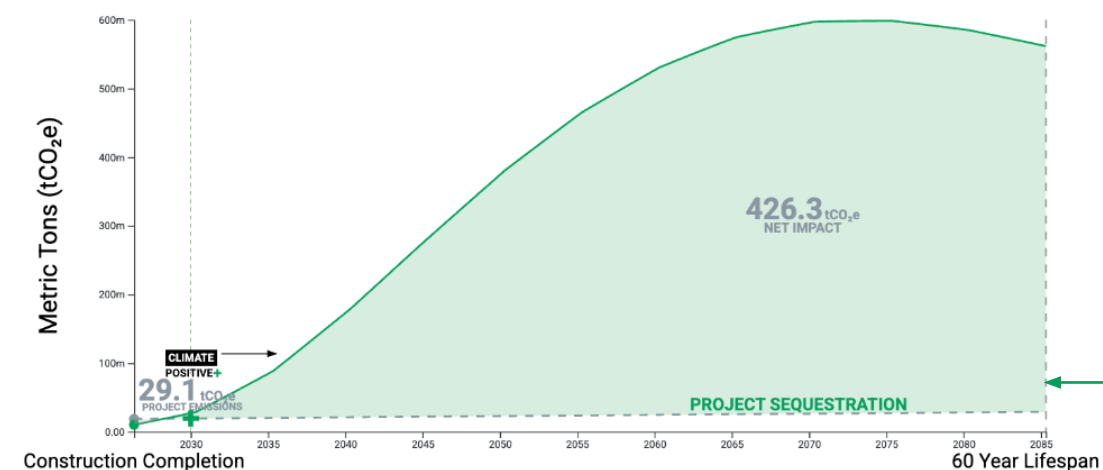
Cooling

Not Designated Severe Heat Zone
97% of Project Site Shaded

Equity

N/A* Designated Underserved Community

Project Impact 4 years to positive



Benefits impacts. Green scores have met the targets.

Improvement comparison to the Primary Baseline

Years to offset emissions. If "∞" infinity symbol appears, the project will never offset those emissions.

Impact over the life of the project. Gray represents emissions, green sequestration. Project Emissions is the sum of Operational, Biogenic and Embodied emissions.

Details of embodied, operations, and biogenic impacts and project benefits are included on page 2

Climate Positive Design Scorecard

Project Name **Climate Positive Park**
Type of Project **Park**

CARBON IMPACT

Embodied Carbon Emissions

Aggregate Asphalt Hardscape		
Compacted Aggregate Base	723 kgCO ₂ e	
Subtotal	723 kgCO₂e	

Concrete Hardscape		
Cast-in-Place Concrete Paving	12,044 kgCO ₂ e	
Reinforcement for CIP Concrete Paving	5,155 kgCO ₂ e	
Subtotal	17,199 kgCO₂e	

Total Embodied Carbon	17,922 kgCO₂e	
------------------------------	---------------------------------	--

Biogenic (Sequestration + Emissions)

Ecosystem Restoration		
Tropical Dry Deciduous	165,210 kgCO ₂ e	
Subtotal	165,210 kgCO₂e	

Ecosystems Existing To Protect		
Tropical Dry Deciduous	4,034 kgCO ₂ e	
Subtotal	4,034 kgCO₂e	

Perennials Perennial Grasses		
Perennials / Perennial Grasses	13,363 kgCO ₂ e	
Subtotal	13,363 kgCO₂e	

Trees		
Deciduous Large Tree	379,112 kgCO ₂ e	
Subtotal	379,112 kgCO₂e	

Total Sequestration	594,227 kgCO₂e	
Total Biogenic-Related Emissions	32,508 kgCO₂e	
Total Biogenic Impact	561,720 kgCO₂e	

Operational Emissions

Landscape Water Use		
Moderate Water Use	34,780 kgCO ₂ e	
Low Water Use	71,547 kgCO ₂ e	
Subtotal	106,327 kgCO₂e	

Maintenance Equipment		
Electric Leaf Blowers / Vacuums	0 kgCO ₂ e	
Gas-Powered Leaf Blowers / Vacuums	0 kgCO ₂ e	
Subtotal	0 kgCO₂e	

Soil Amendments Mulch		
NPK Fertilizer Application	11,193 kgCO ₂ e	
Subtotal	11,193 kgCO₂e	

Total Operational Carbon	117,521 kgCO₂e	
---------------------------------	----------------------------------	--

Net Impact over 60 Years	426,277 kgCO₂e	
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BENEFITS

Biodiversity

Ecosystem Protection		
Native Ecosystems Protected	65 %	
Native Ecosystems Removed	35 %	

Biodiversity Net Impact		
Native Ecosystem Impact	38 %	
Native Ecosystem Restored	4,900 m ²	
Native Ecosystem Removed	1,400 m ²	
Native Planting Impact	-22 %	
Native Trees Planted	70 %	
Native Trees Removed	75	
Native Shrubs Planted	0	

Native Perennials Planted	220 m ²	
---------------------------	--------------------	--

Habitats to Protect or Restore

Biome	Tropical & Subtropical Moist Broadleaf Forests	
Ecoregion	Magdalena Valley montane forests	

Water

Evapotranspiration		
Average Annual Potential	1,739 mm/yr	
Evapotranspiration (ET _o)		

Landscape Water Use		
Total Planted Area	2,500 m ²	
Annual Baseline	4,347,500 L/y	
Maximum Water Allowance	3,043,250 L/yr	
Annual Site Water Usage	1,476,770 L/yr	
Reduction From Baseline	66 %	

Cooling

Heat Island		
Severe Heat Area	No	

Shade		
Broad Biome	Forest	
Total Area Shaded By Trees	7,565 m ²	
Percentage of Site Shaded By Trees	77 %	
Total Area of Shade Structures	2,000 m ²	
Percent of Area Shaded by Structures	20 %	

Equity

Overburdened and Underserved Communities		
Underserved Community	No	
Community Engagement	N/A*	

Green text represents sequestration and targets met

* N/A: Not Applicable based on location or no data entered.
** : Based on data entered, project will not become climate positive.

< 1 2 > Download as pdf

My Projects

GARDEN

0 years to positive

Demolition Study

Demo

GARDEN

0 years to positive

Bridge Project

PARK

11 years to positive

Climate Positive Park

Parking lot transformation

PARK

0 years to positive

Airport

Parking lot transformation

PARK

0 years to positive

Roof Garden

New project

Select My Projects or hit the back button to access all your projects.

Click to access a project

Start a new project

Profile button

Your Name

Your Organization

My projects

climatepositivedesign.com

Donate

Logout

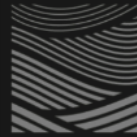
view all projects or start a new one

climate**positive**
design



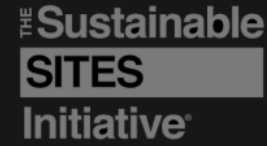
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... and keep going!



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