Carbon Conscience:

Considering Embodied Carbon in Planning

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Carbon Conscience

BETA

EMAIL

example@domain.com

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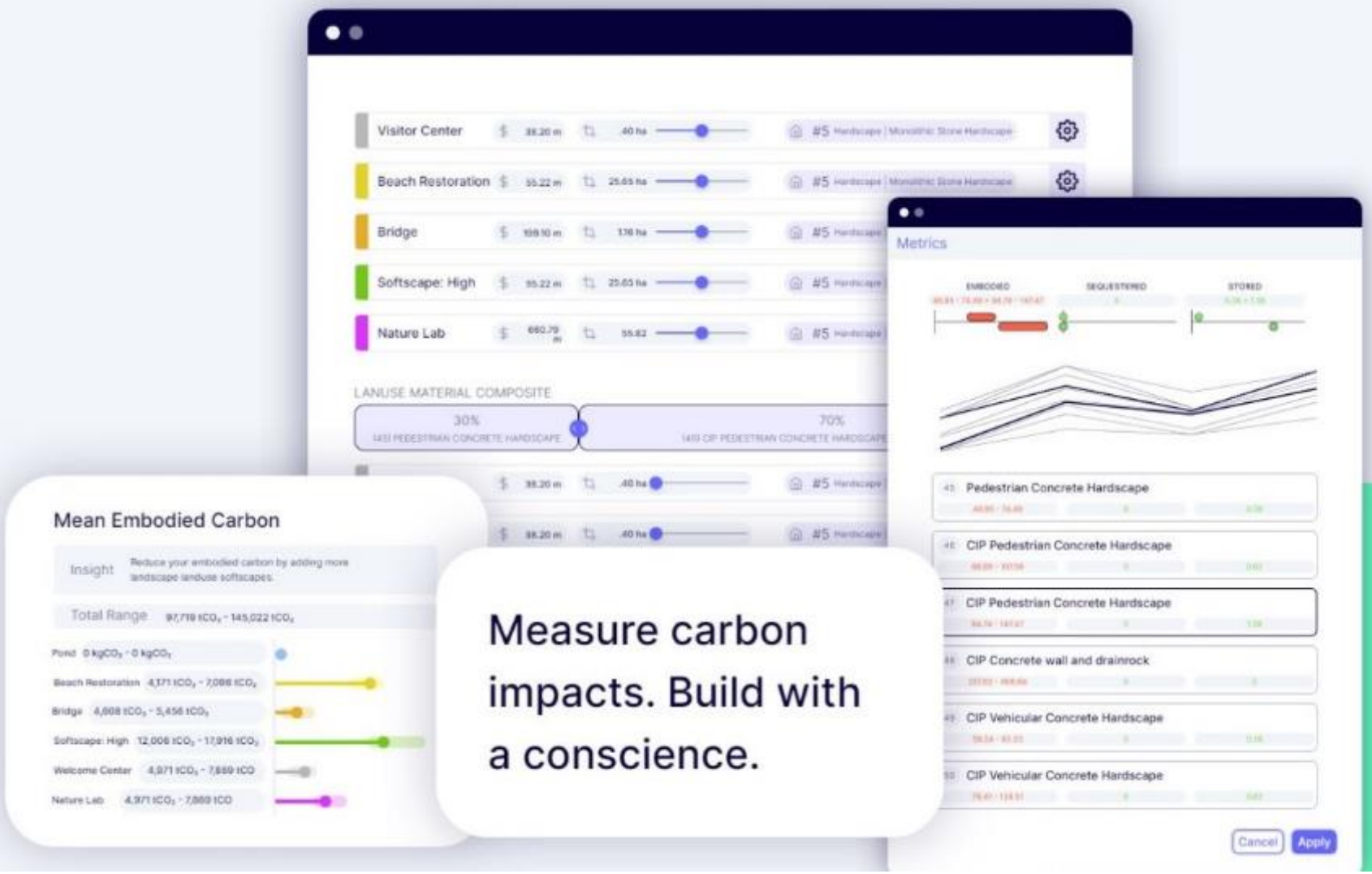

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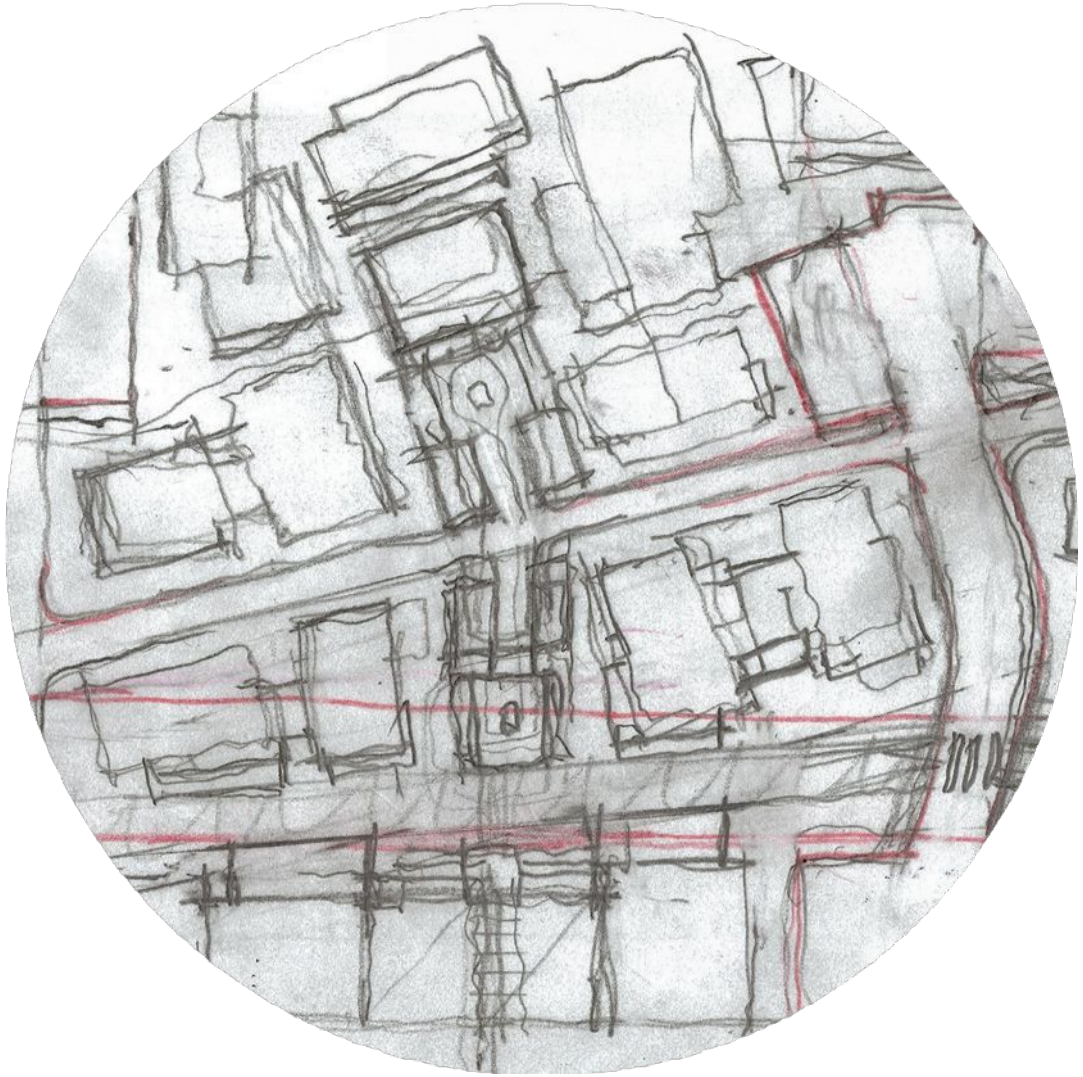
How do we consider carbon from the earliest design phases?

Perhaps before there is even a project...



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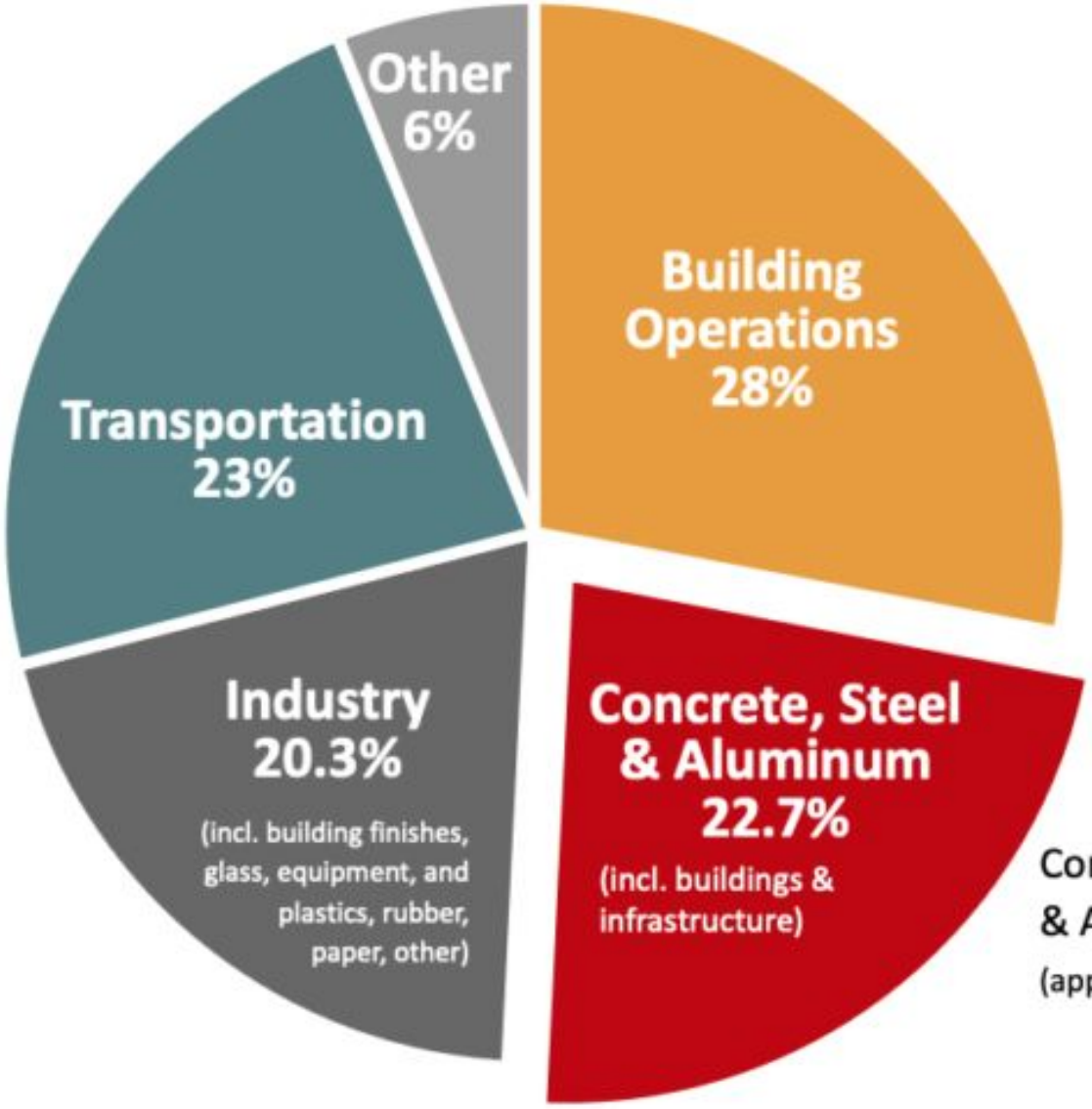
Our urban design plans will affect the next 50 + years…

Global Carbon Emissions by Sector

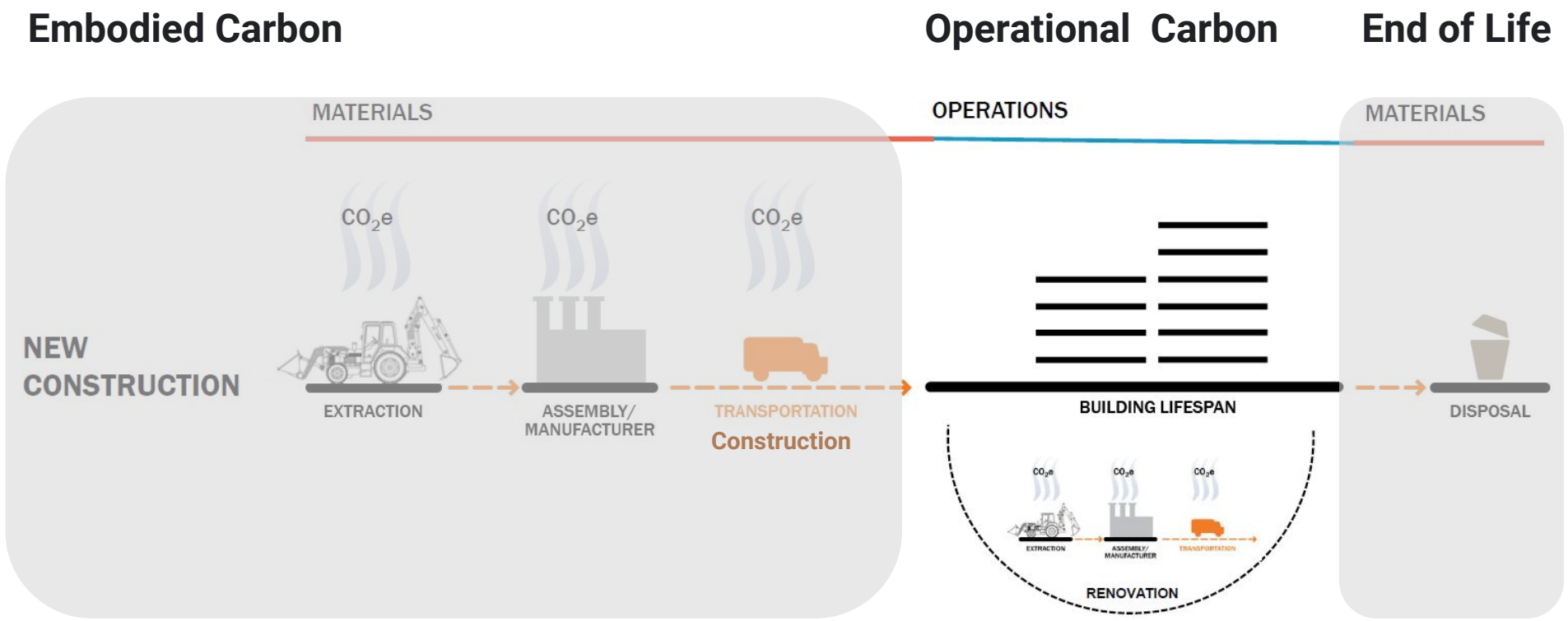


Concrete 11.1%, Steel 10.1% & Aluminum 1.5%
(approximate, 2017)

Source:
2018 Global ABC Report; IEA

A planning tool to consider embodied carbon in materials for both architecture and landscape

Embodied vs. Operational Carbon



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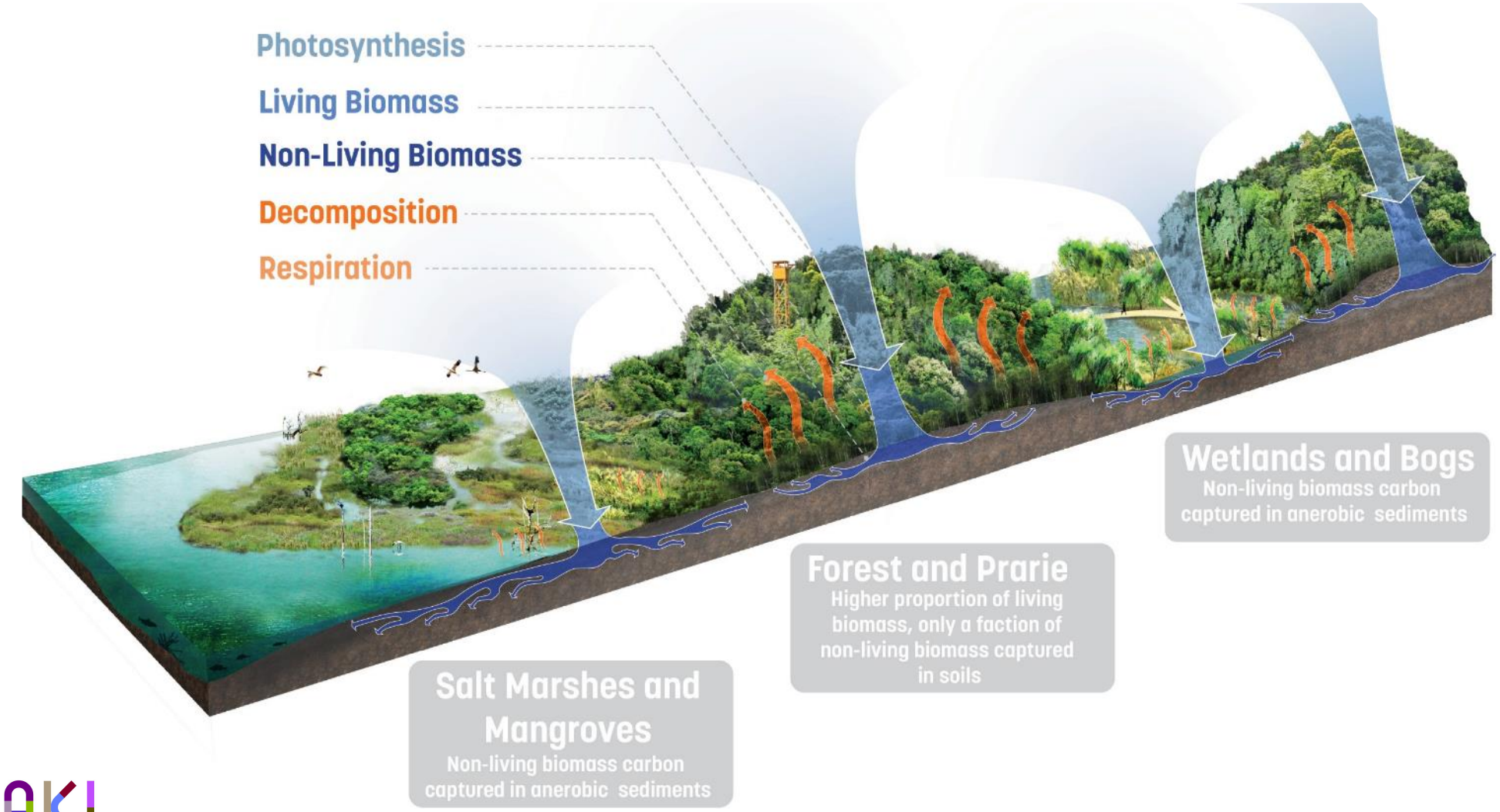
Source: Atelier 10

Project Planning: Architecture, Landscape, Infrastructure

Carbon Sequestration



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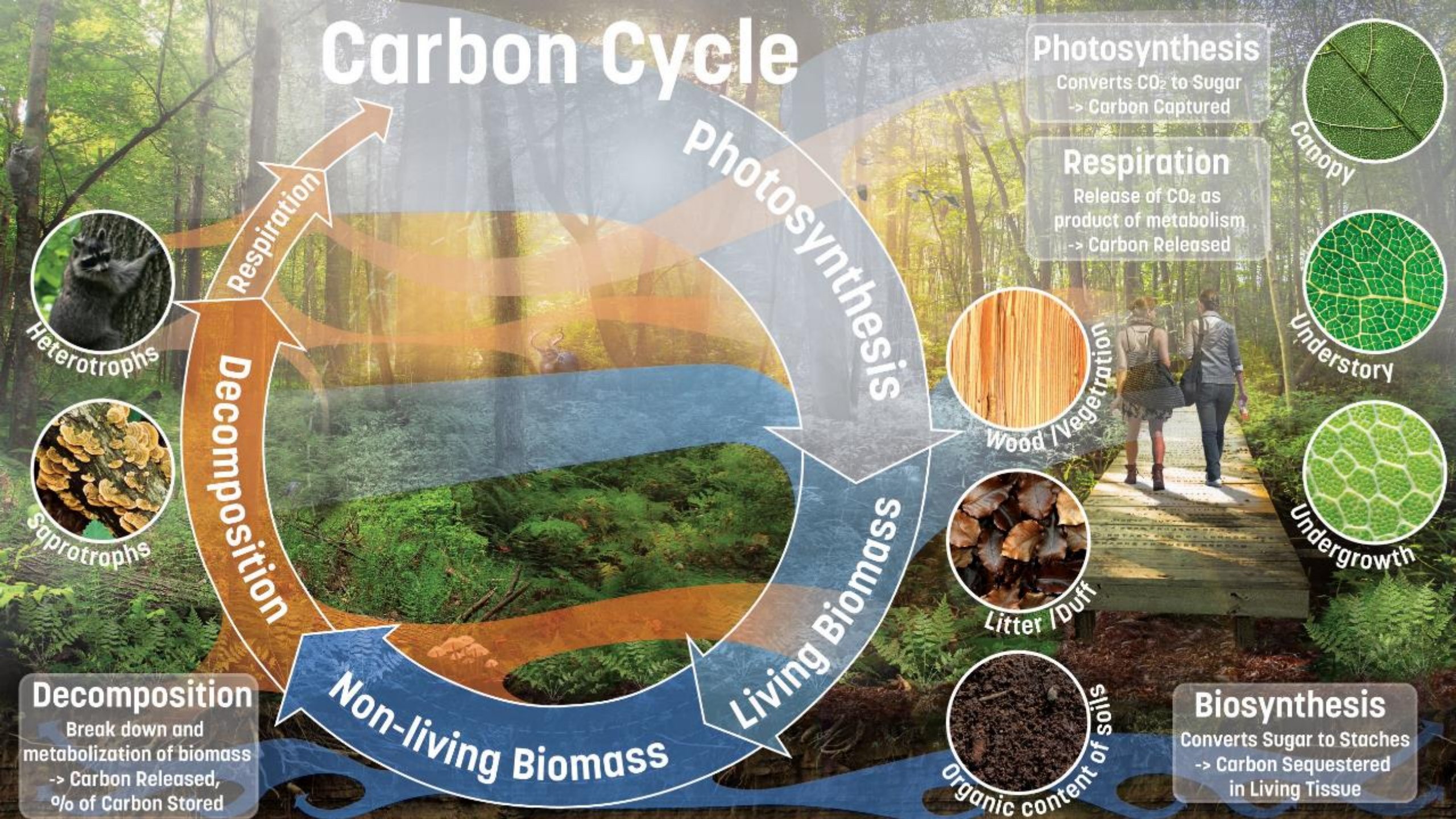
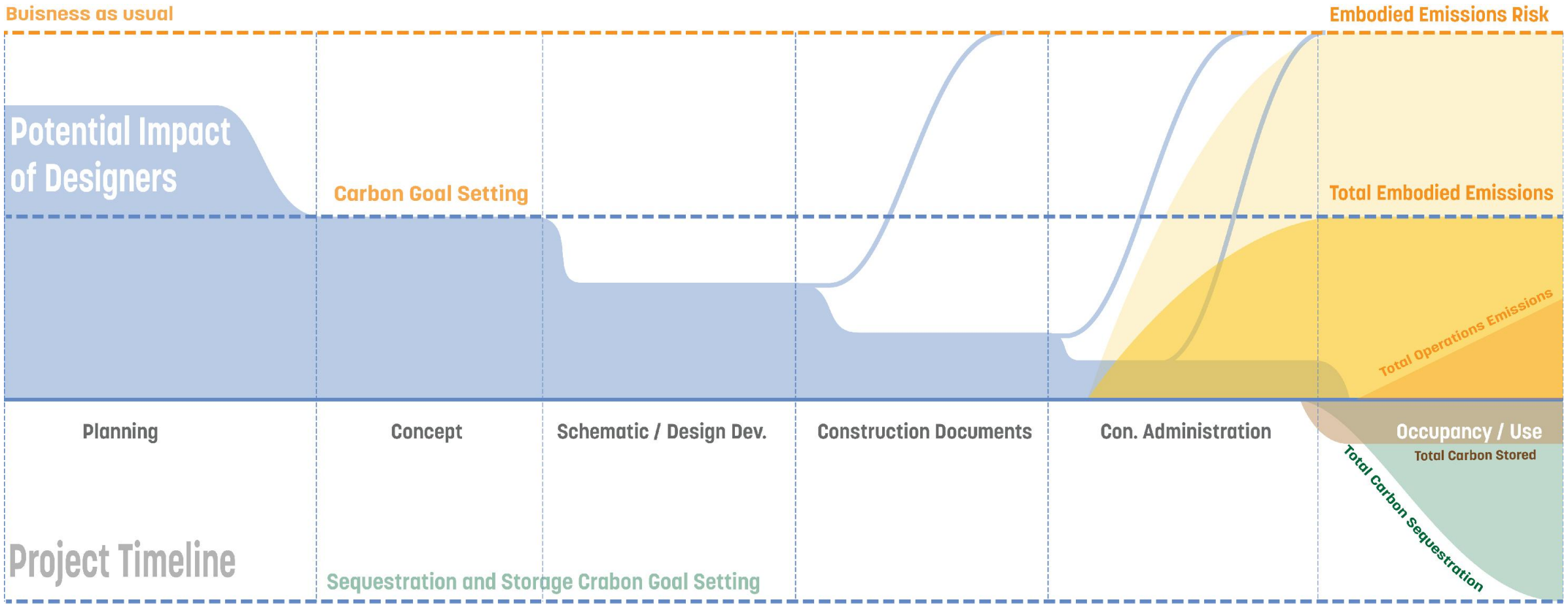
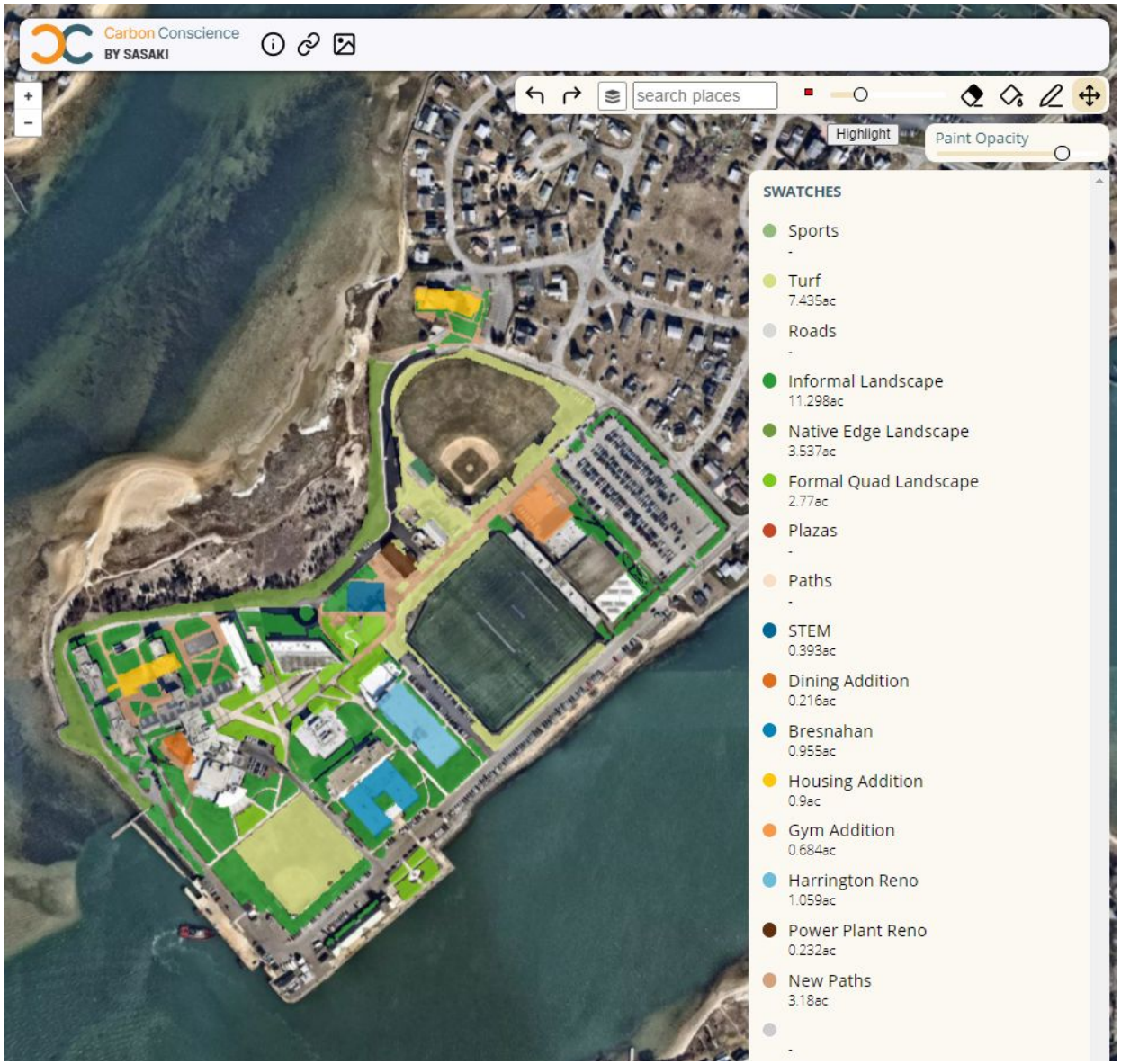
Carbon Cycle

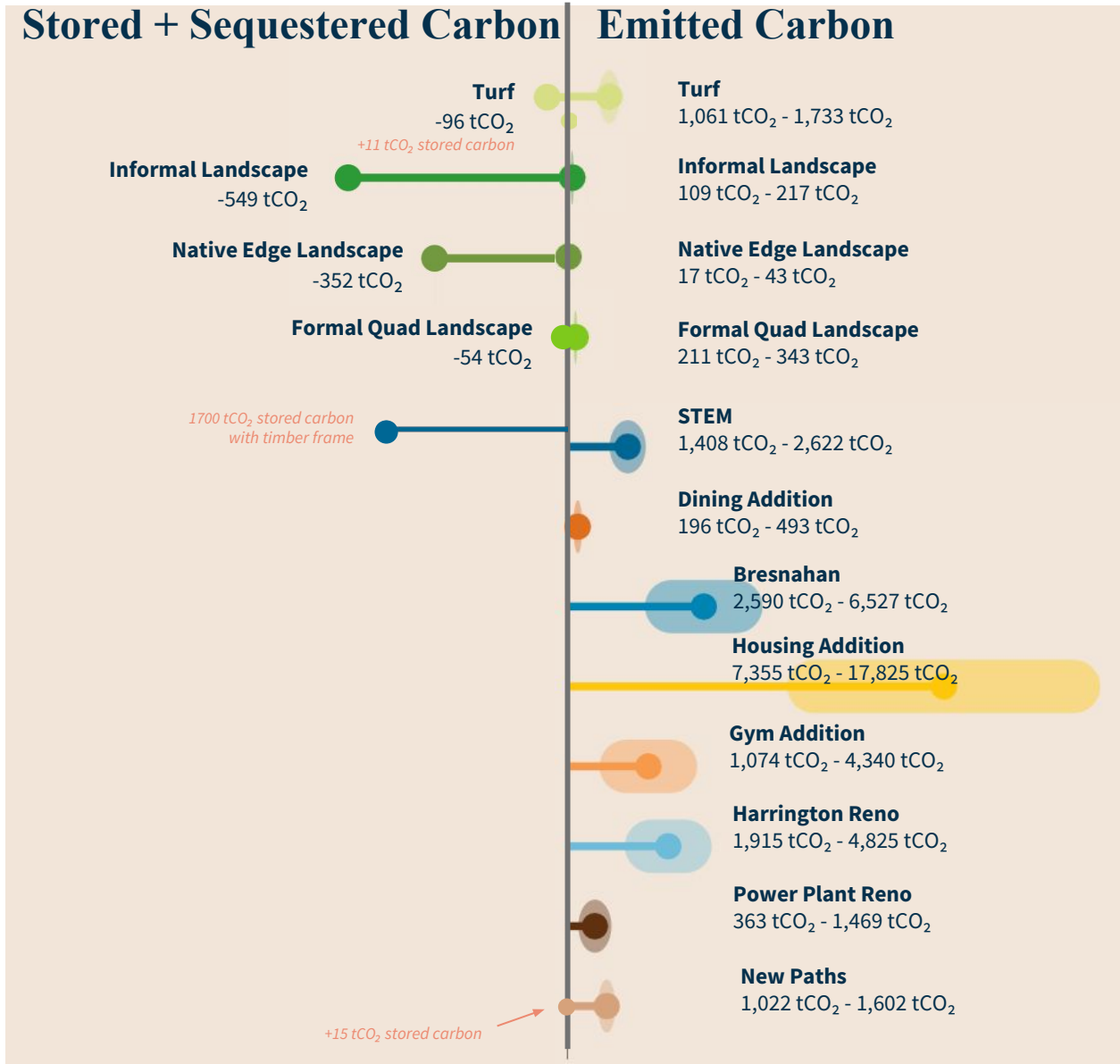


Decarbonizing Design Starts with Planning

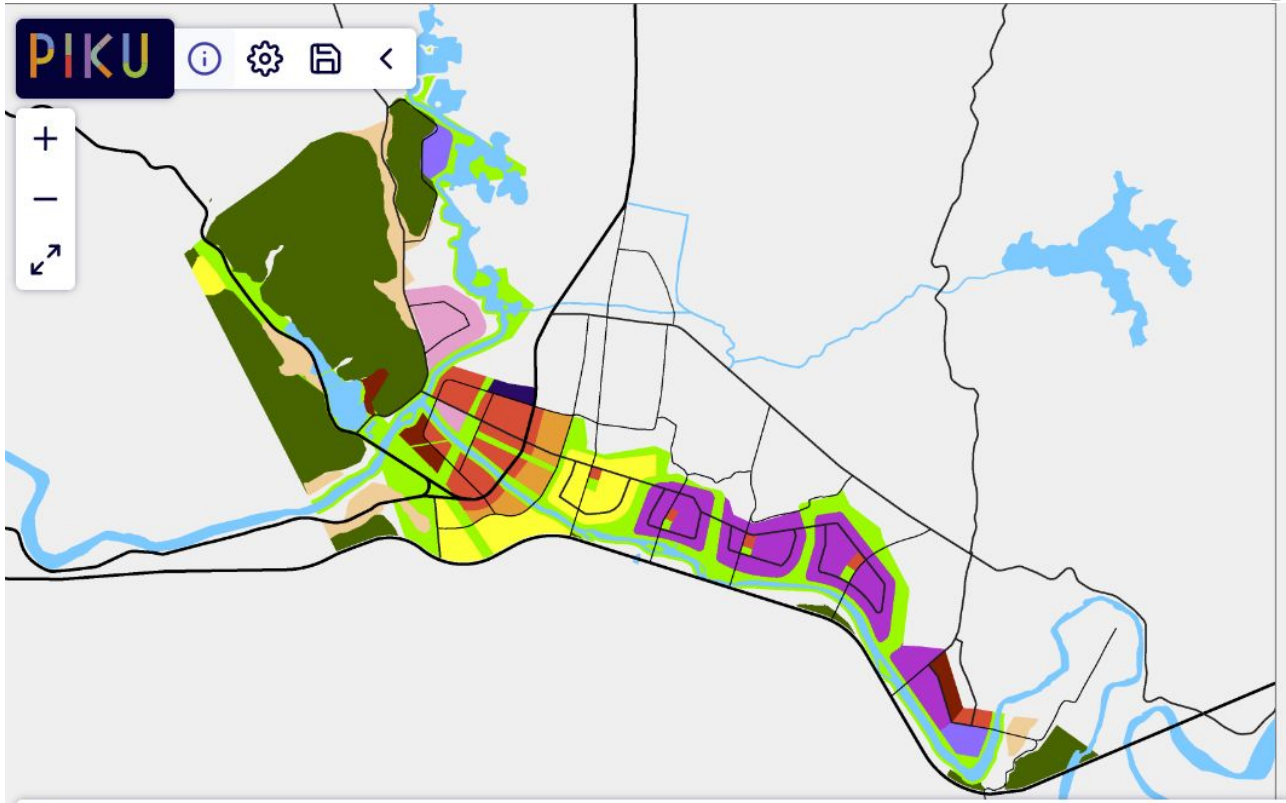


Land Use Decisions Make a Big Difference





Land Use Decisions Make a Big Difference



Manage Images

Upload an Image

3370 × 2384 (14 unique colors)

Update

Remove

Image Color Mappings

Guess from Color

348,369 px	Preserved tropical Fo
274,960 px	Water
195,381 px	Wetlands
103,301 px	Resort
91,526 px	Roads
63,849 px	Rice Fields, village
54,540 px	City Center
53,666 px	Existing Village
48,669 px	Roads

Landuse Totals

Send to CC

Assuming an image width of: 1,000 Meters

Residential	1,754 sq m
Preserved tropical Forest	30,675 sq m
Eco Tourism/Culture centre	4,089 sq m
Hotel	1,482 sq m
City Center	4,802 sq m
Rice Fields, village	5,622 sq m
Community center	402 sq m

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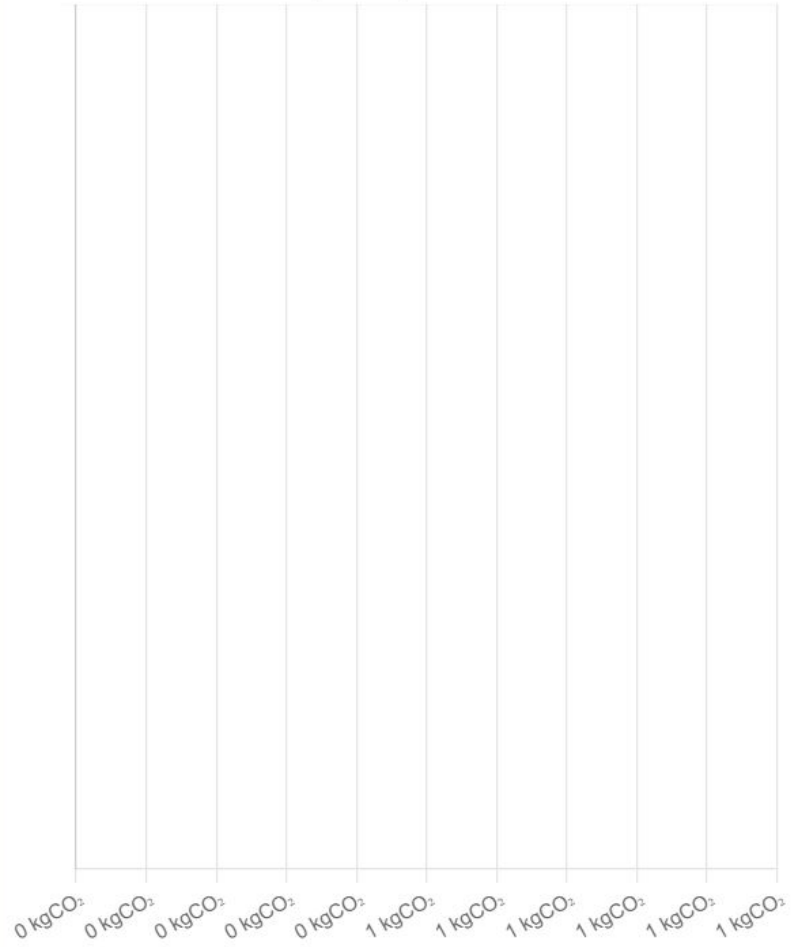
Metrics

View carbon impacts update as you test landuse assumptions. Carbon units (tCO_2) are tonnes of CO_2 equivalent.

Embodied Carbon (tCO_2)



Total 0 $kgCO_2$ - 0 $kgCO_2$ (high value charted)

Landuse Manager > Edit Landuse > Select Material

Choose the material for this component

Preserved tropical Forest

	Cost Low	Cost High	Sequestered	Stored
Previously applied: 6 Peat Swamp	-	-	-535.82	-20.6
Currently applied: 7 Subtropical Humid Forest	-	-	-	-5.05

Existing to Remain

Existing to remain vegetation

IN THE WEEDS

Assume untouched mature ecosystem

		Cost Low	Cost High	Sequestered	Stored
3	Tropical Dry Deciduous	-	-	-	-4.05
4	Tropical Shrublands	-	-	-	-5.43
5	Mangrove	-	-	-321.49	-12
6	Peat Swamp	-	-	-535.82	-20.6
7	Subtropical Humid Forest	-	-	-	-5.05
8	Dry Forest (Mediterranean)	-	-	-	-8.71

Cancel Apply

Sketch, Test and Iterate

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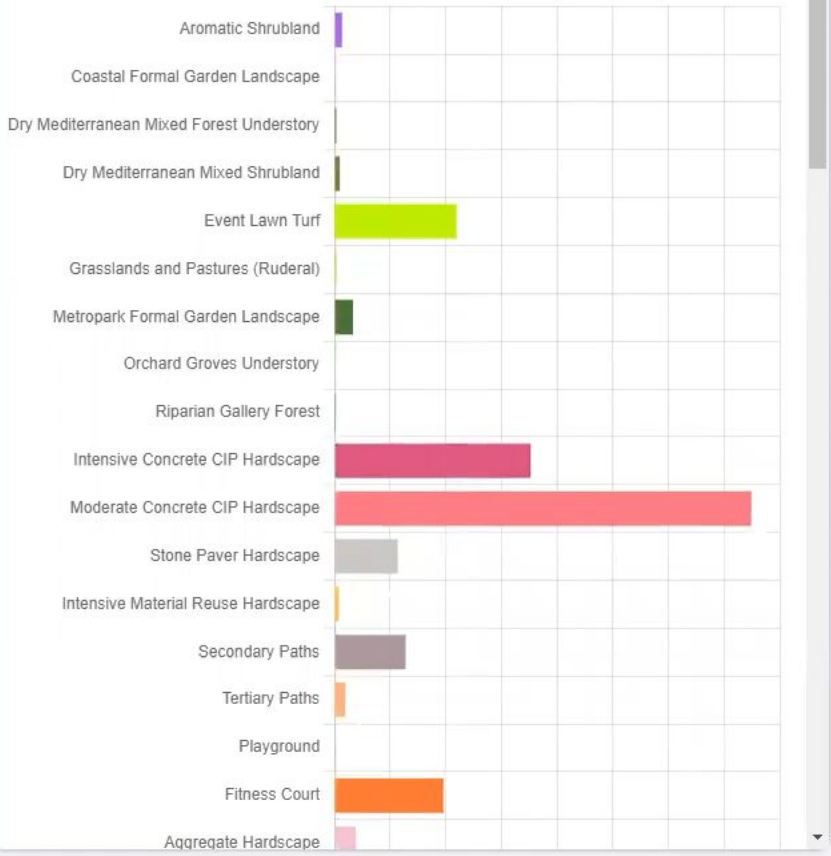
Metrics

View carbon impacts update as you test landuse assumptions. Carbon units (tCO_2) are tonnes of CO_2 equivalent.

Embodied Carbon (tCO_2)



Landuse Manager

Create and edit landuse elements, then assign materials to see impacts

Aromatic Shrubland	#130	Reforestation/Ecosystem Restoration. Trop	17,361
Coastal Formal Garden Landscape	#141	Cultivated Garden. Low Intensity Temperat	4
Coastal Naturalistic Successional Forest	#134	Reforestation/Ecosystem Restoration. Dry	0
Dry Mediterranean Mixed Forest Understory	#134	Reforestation/Ecosystem Restoration. Dry	4,741
Dry Mediterranean Mixed Shrubland	#130	Reforestation/Ecosystem Restoration. Trop	12,500
Event Lawn Turf	#124	Sod turf over ameded soil over underdrain	19,039
Freshwater Wetlands	#140	Reforestation/Ecosystem Restoration. Tem	0
Grasslands and Pastures (Ruderal)	#139	Reforestation/Ecosystem Restoration. Dry	10,023
Metropark Formal Garden Landscape	#142	Cultivated Garden. High Intensity Tempera	30,304
Orchard Groves Understory	#134	Reforestation/Ecosystem Restoration. Dry	155
Riparian Gallery Forest	#133	Reforestation/Ecosystem Restoration. Sub	1
Intensive Concrete CIP Hardscape	#47	CIP Pedestrian Concrete Hardscape. Compl	6,987
Moderate Concrete CIP Hardscape	#46	CIP Pedestrian Concrete Hardscape. Mostly	20,856

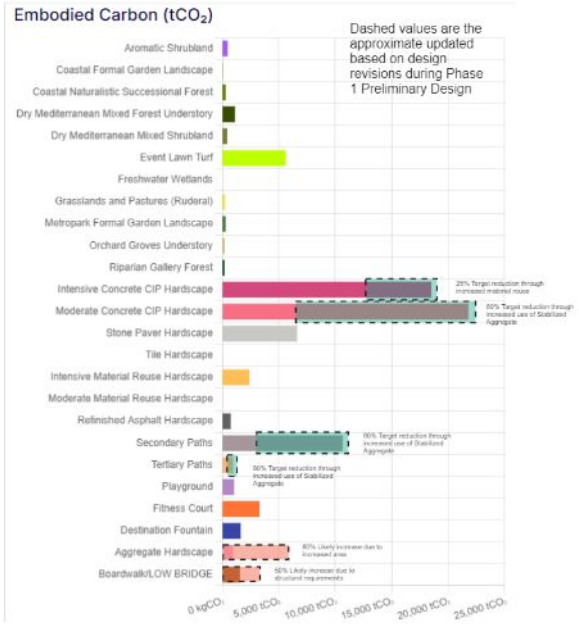
Phase List

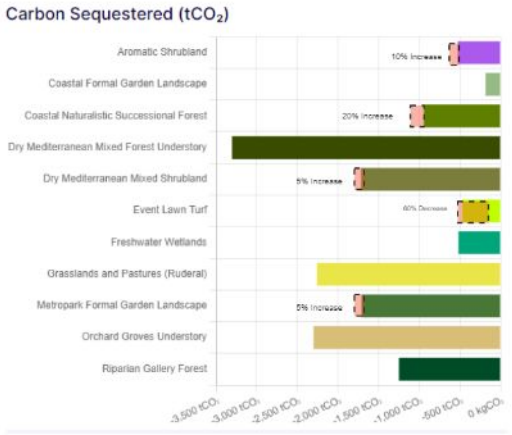
Select specific phases within the design scheme

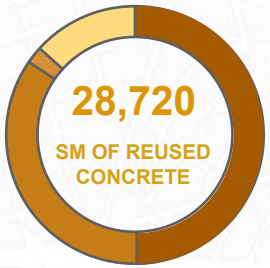
Composite

- Park Phase 1
- Park Phase 2
- **ACA Phase 1**
- CFA Phase 1
- Bridge Phase 2
- Total

Inform early decisions with data







12,829
Trees

Pre/Post ecological Survey

I:	Project Information	Project Phase and Date
1	Project Name (Match the project name on Vision)	
2	Sasaki Project Number (nnnnn.nn)	
3	Link to Project Submission Drawings from G: Drive	
4	Link to Project Specifications or Narrative from G: Drive	
5	Link to Project Directory from G: Drive	
	Type of Project (Master Plan, Built, etc.)	
	Project Market (Urban Development, Civic Park, Campus, etc)	
	Project Design Size (acres or hectares)	
6	Year Project Design Work Began / Completed (yyyy)	
7	If Built, Expected Year of Occupancy (yyyy)	
8	City that Project is located in	
9	State or Province that project is located in (name, not abbreviation)	
10	Country that Project is located in	

II:	Project Ecological Characteristics	
	Project is located in this Biome (US EPA, WWF, or TNC)	
	Level IV Ecoregion (US EPA, WWF, or TNC)	
	Project Location Type (Urban Infill, Greenfield, Natural Areas Restoration, Suburban)	
	Project Climatic Characterization / Classification:	
	Habitat Context: Please describe nearby and notable ecological characteristics of the site (i.e. large continuous forest, wetlands, dense u	
	Kown Local Threatened or Endangered Species (provide a link or list these species here)	

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Community of Architecture Firms and NGOs WBLCAs, Product EPDs

Athena
Impact Estimator
for Buildings

Ellinikon Park, Athens, Greece

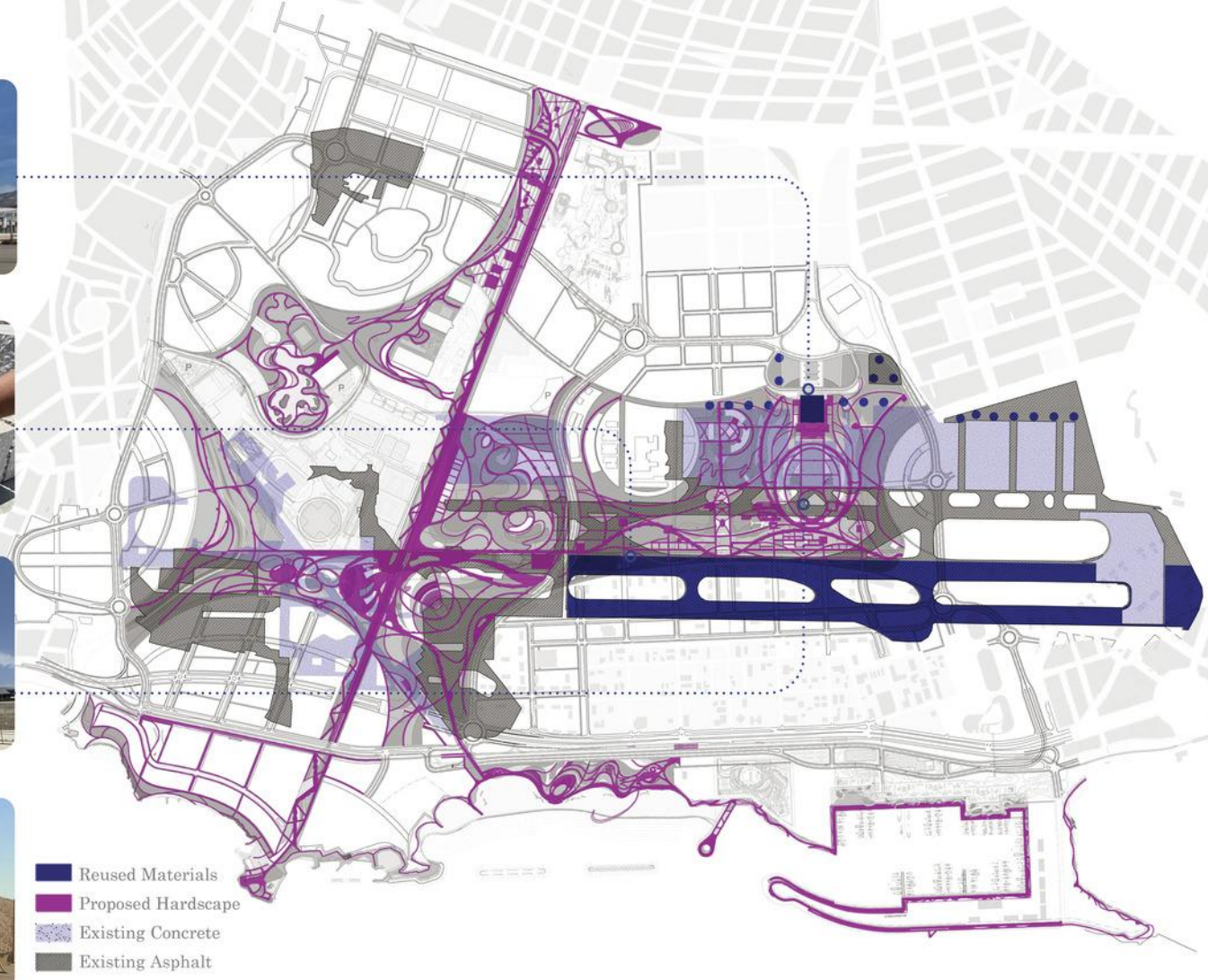
ENGAGING CULTURAL TRADITIONS OF MATERIAL REUSE

SAARINEN AIRPORT BUILDING

TARMAC AND RUNWAY CONCRETE

EXISTING LIGHT POLES

CRUSHED MATERIAL ON SITE



DESIGNED REUSE STRATEGIES

PAVEMENT USING REUSED MATERIAL ON SITE

CUSTOM FURNITURE USING SALVAGED CONCRETE FROM RUNWAY

SALVAGED CONCRETE SLABS FOR FOUNTAIN DESIGN

REUSE TARMAC AND CRUSHED MATERIAL FOR AGGREGATE


PLACEMAKING THROUGH MATERIALITY
ENHANCED SENSE OF PLACE THROUGH PLANTING
REPURPOSED CONCRETE RUNWAY SLABS
LOCALLY SOURCED PAVING
AGGREGATE AND PAVERS FROM EXISTING SITE MATERIAL
MATERIAL REUSE THROUGH FURNISHING

We are responsible for what we design.
Every design has a carbon impact.
Consider carbon from the onset of the design process.
Set—and track—an embodied carbon budget.
Reuse existing buildings and landscapes.

Less is more.
Green is more.

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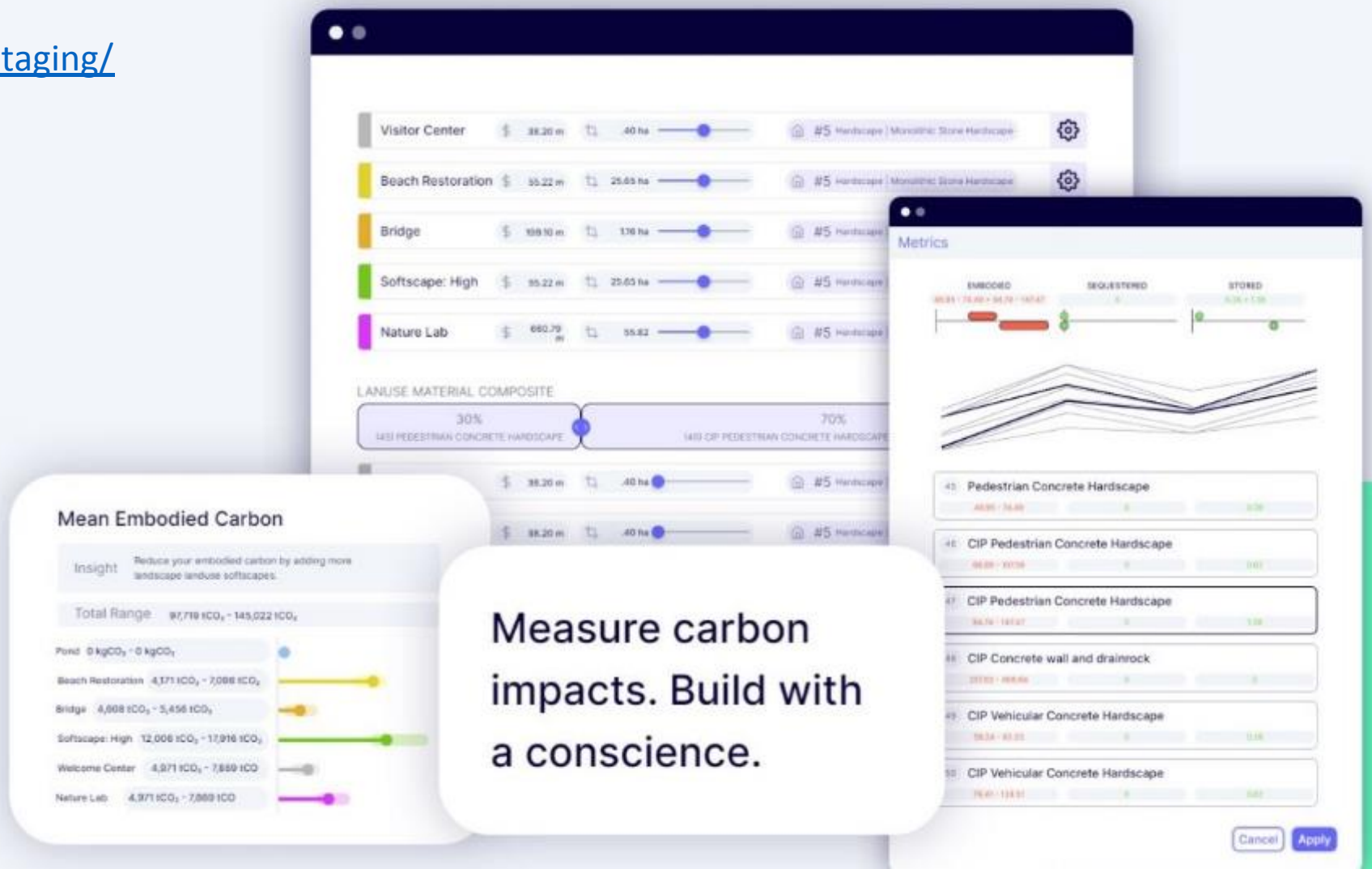
Try It!

https://carbon-conscience.web.app/

https://visualizations.sasaki.com/staging/carbon-conscience-public/



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