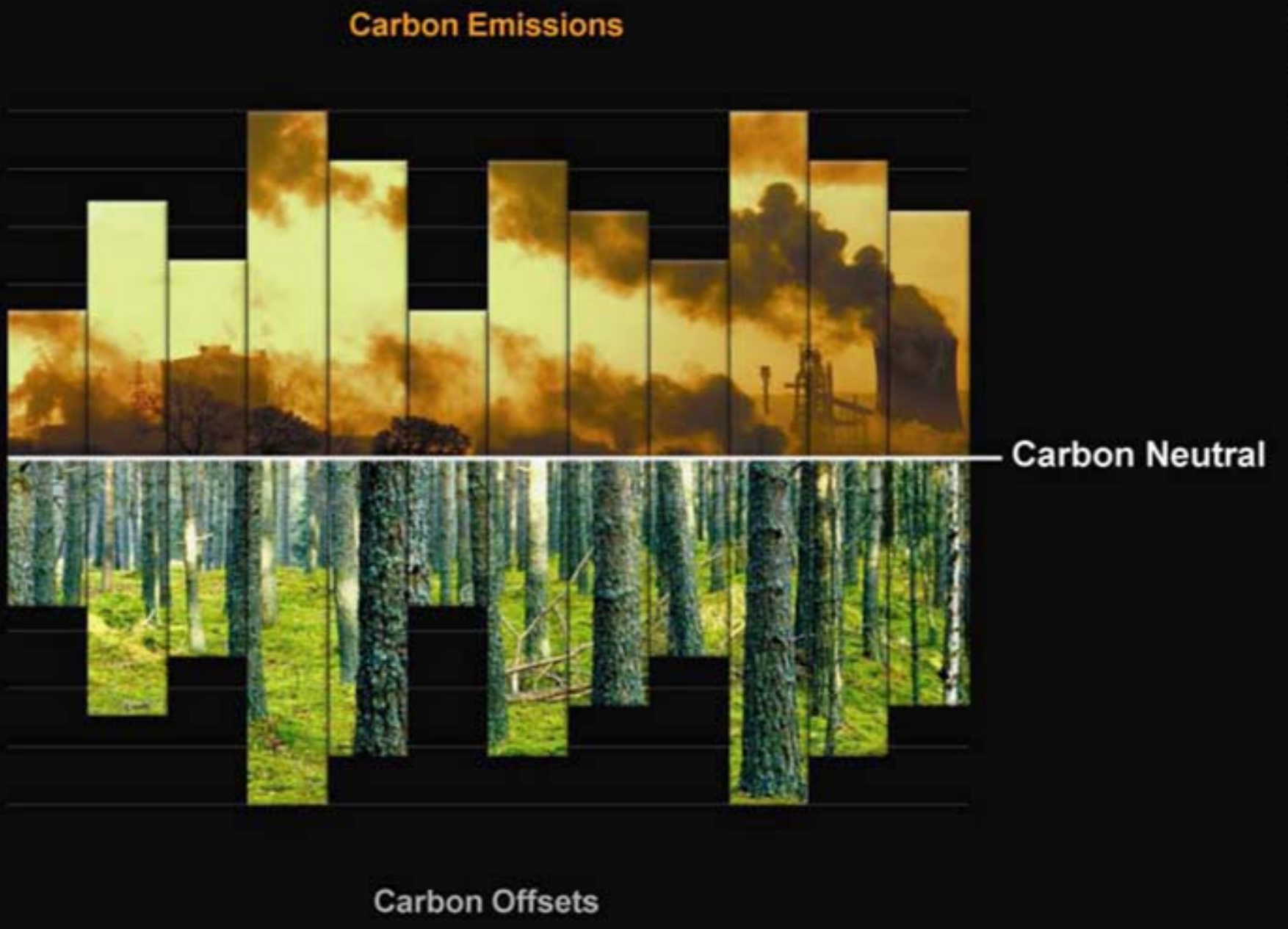
Lloyd Green District 3.2.09

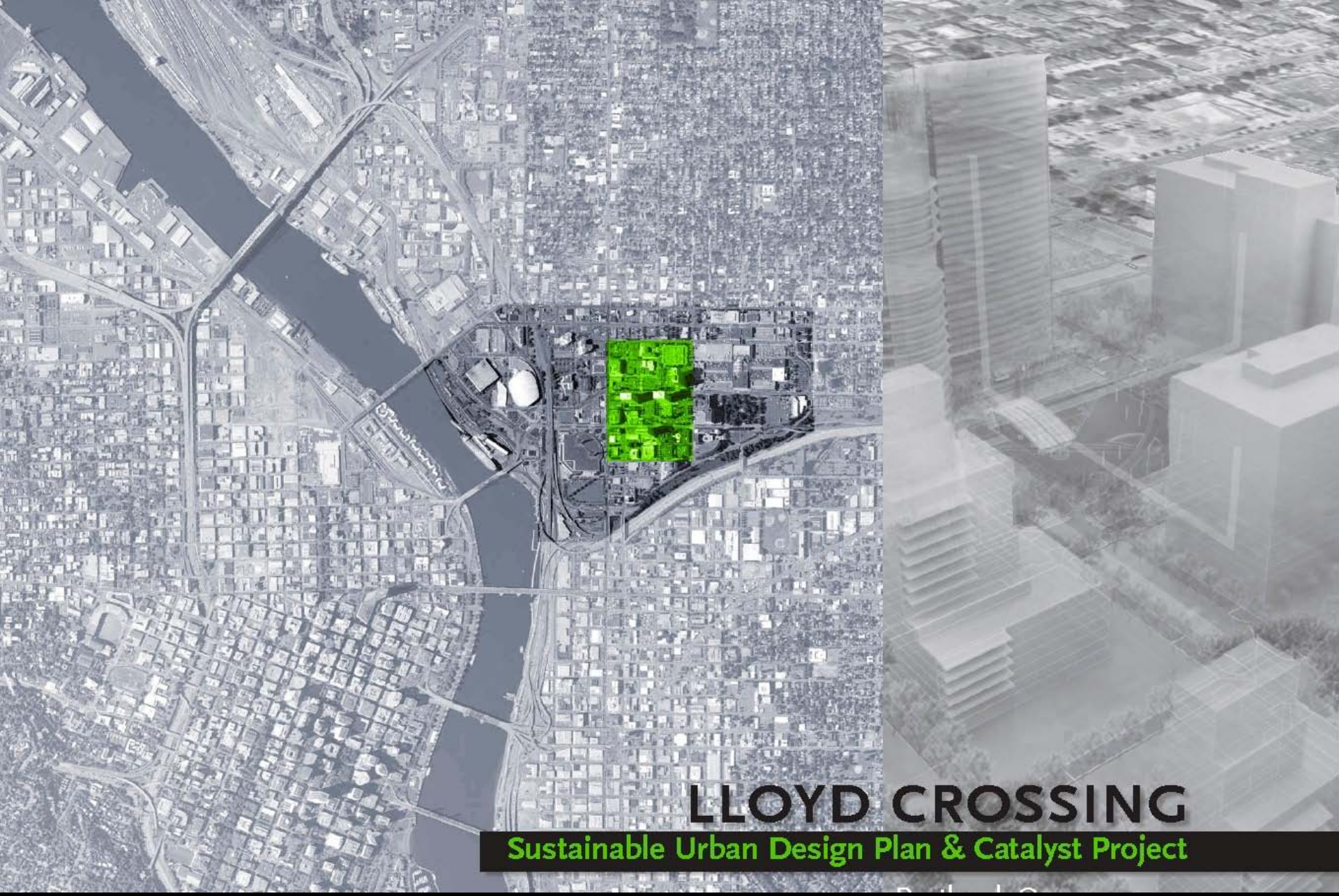
Bert Gregory FAIA

MITHŪN

MITHŪN


Carbon Emissions
Carbon Neutral
Carbon Offsets

MITHŪN



LLOYD CROSSING

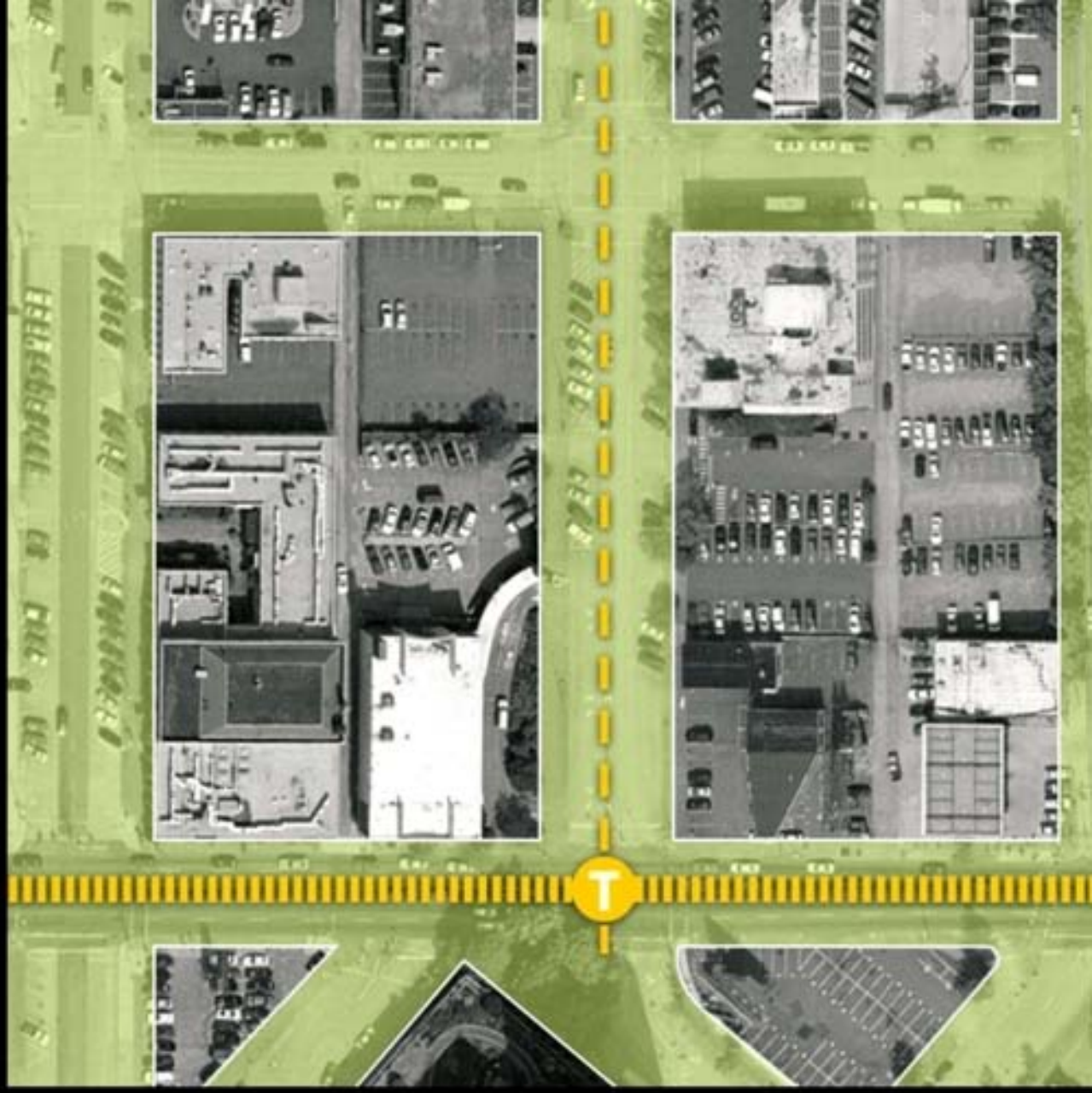
Sustainable Urban Design Plan & Catalyst Project

MITHŪN

MITHŪN

Private

Public



Private
+
Public

MITHŪN

Private

Portland State University

Stephen Epler Hall

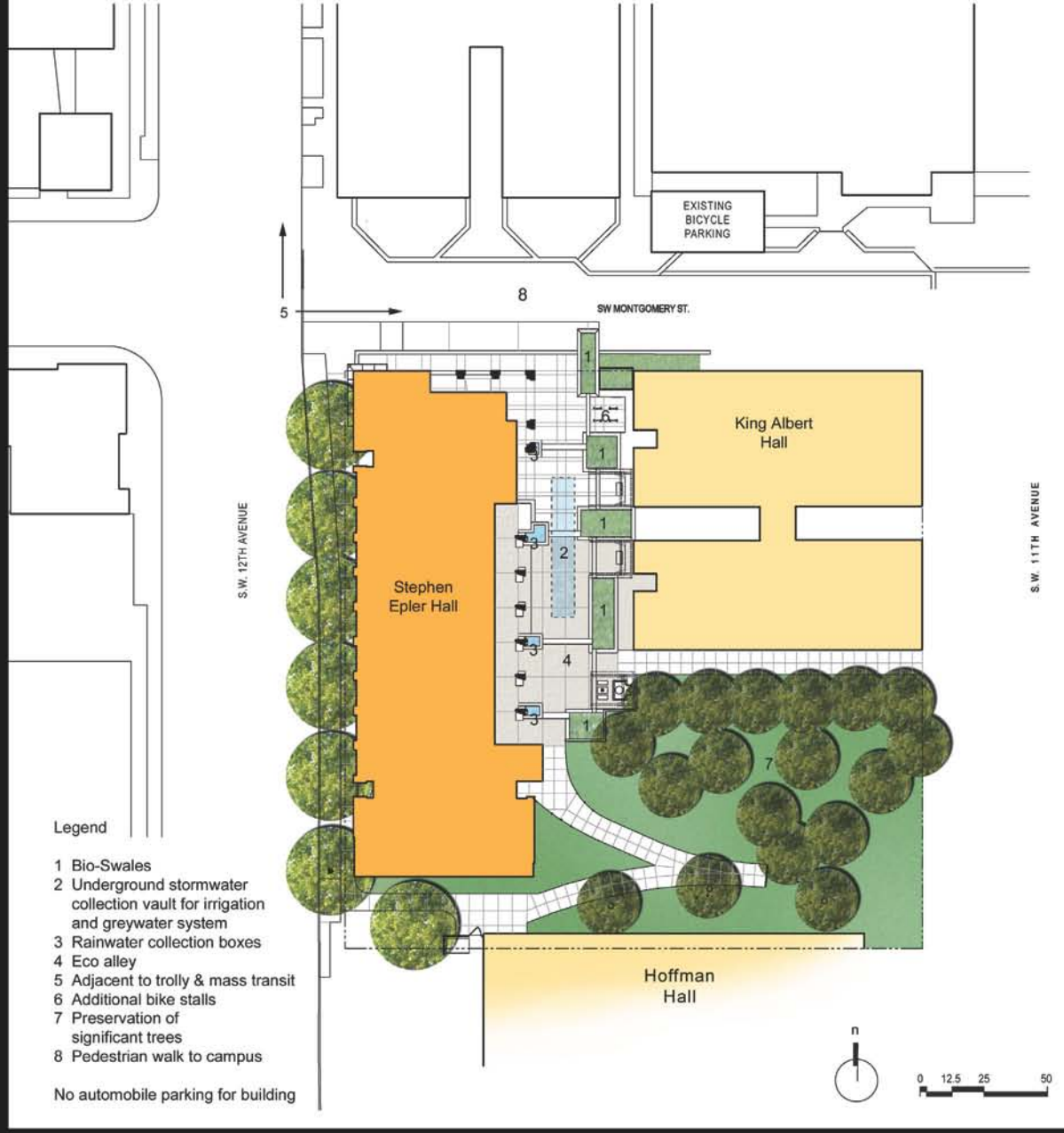
MITHŪN

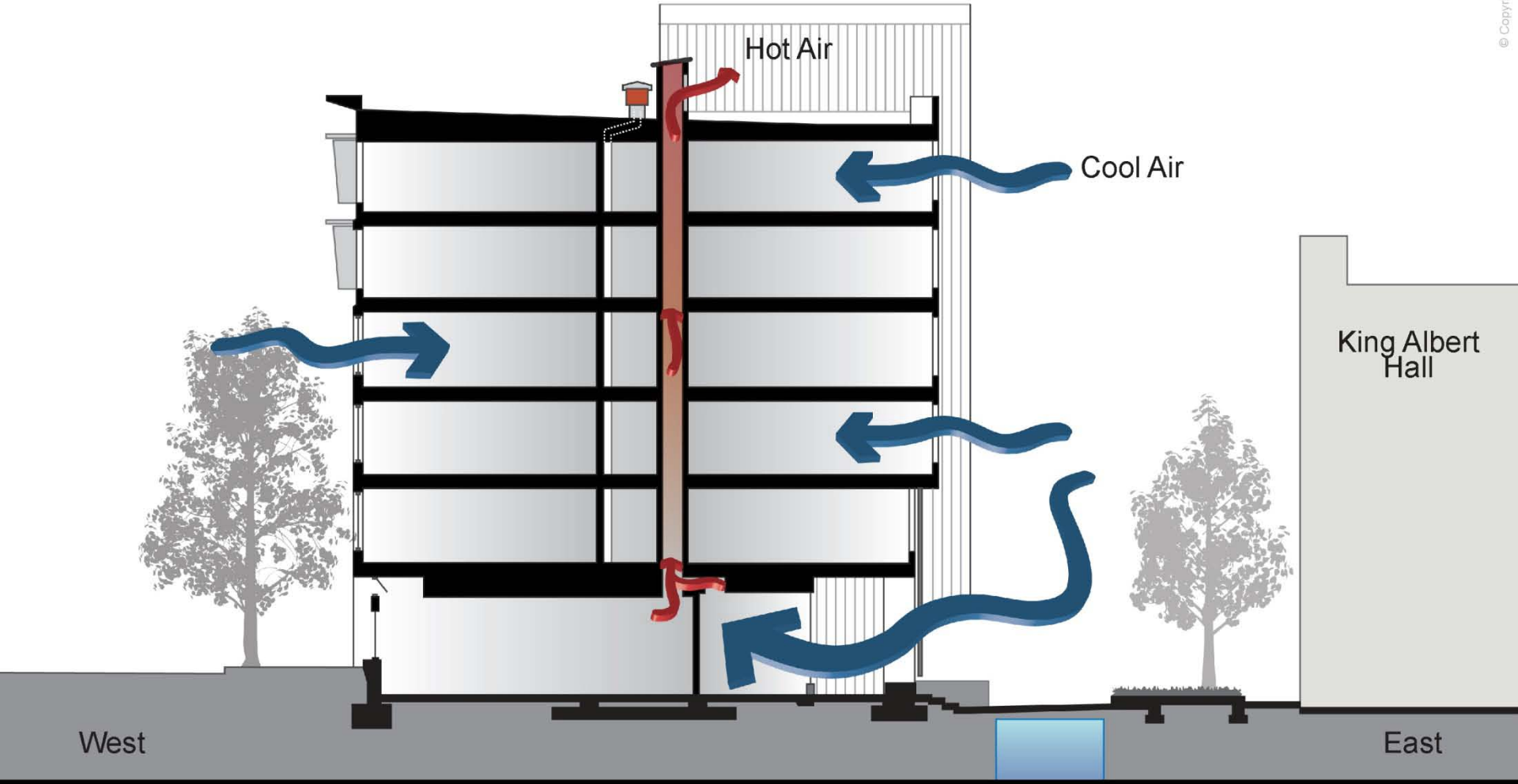
National

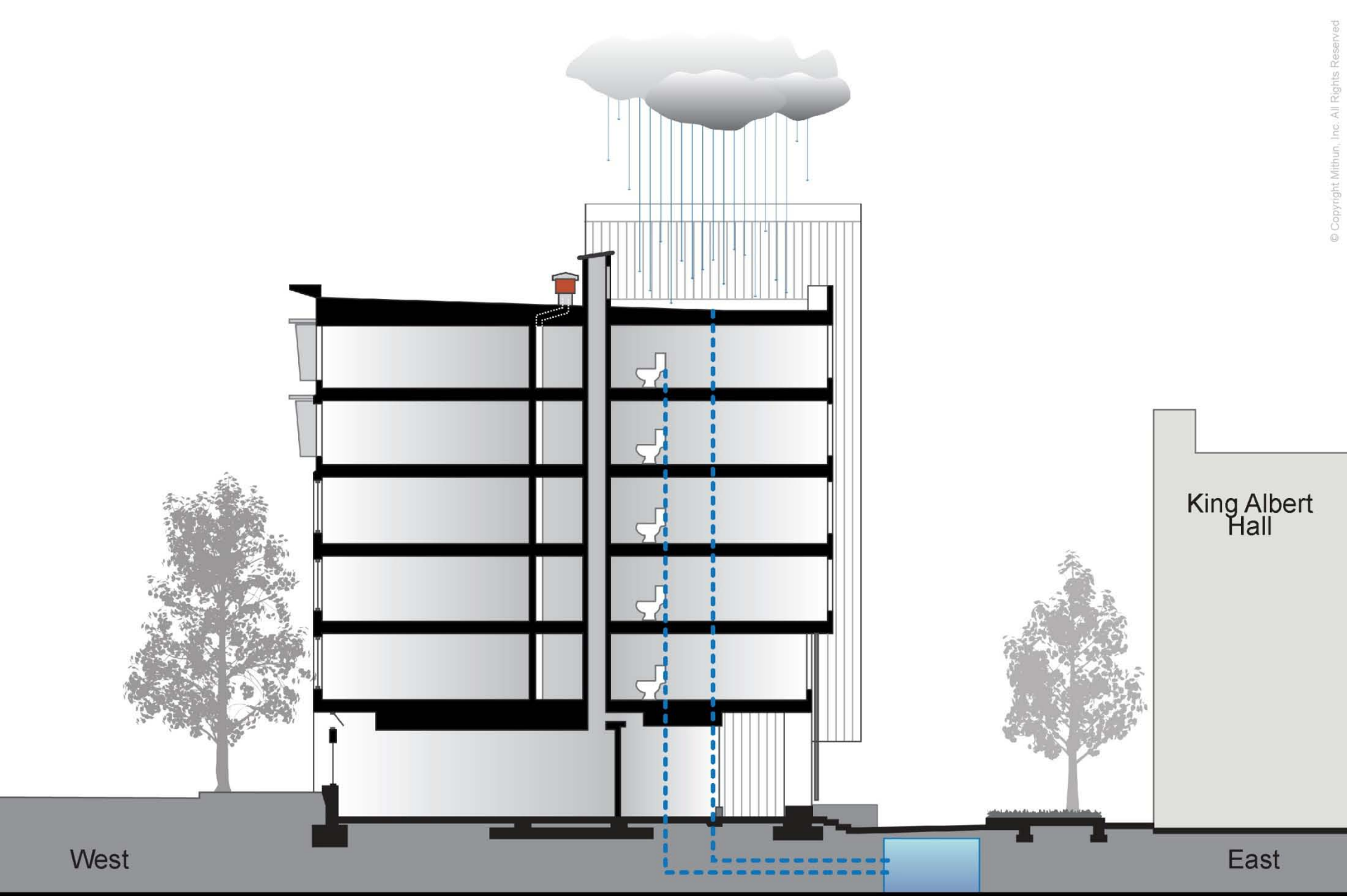
The Big Pipe

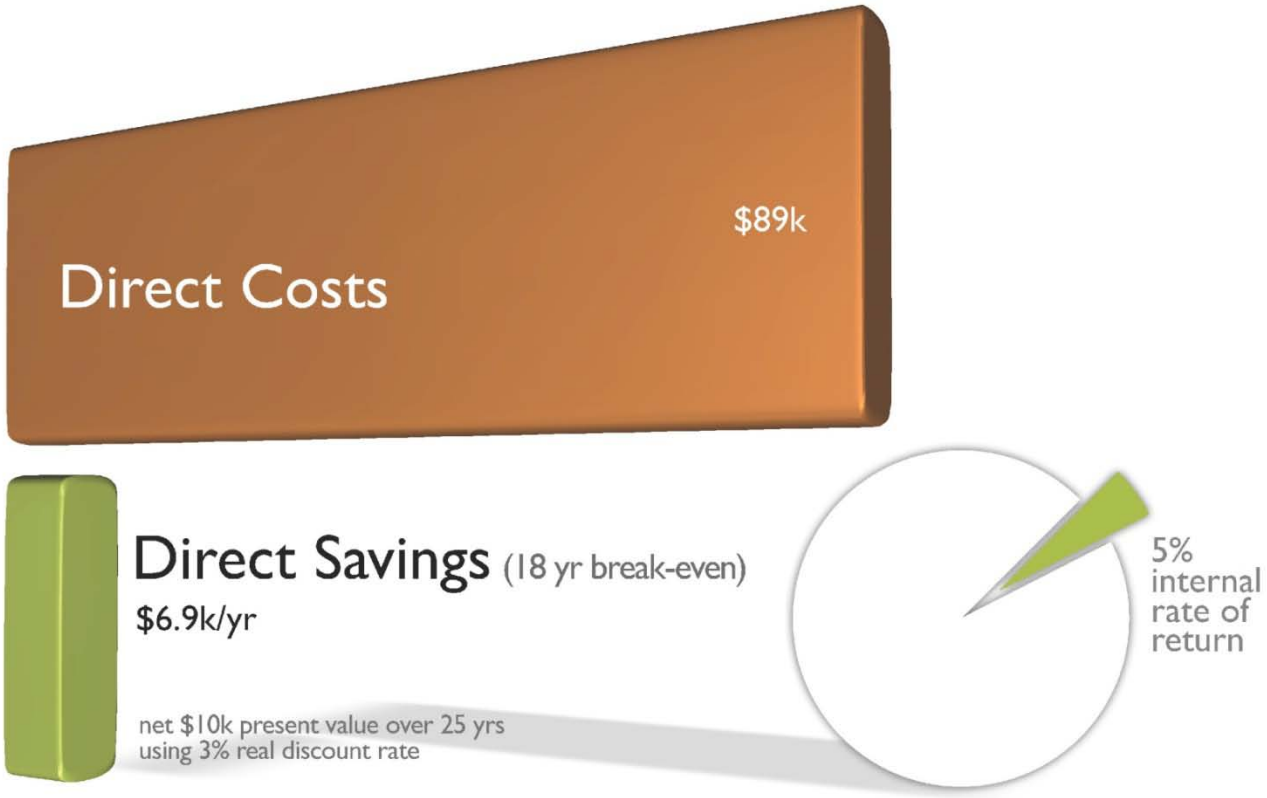
Portland Stormwater

MITHŪN





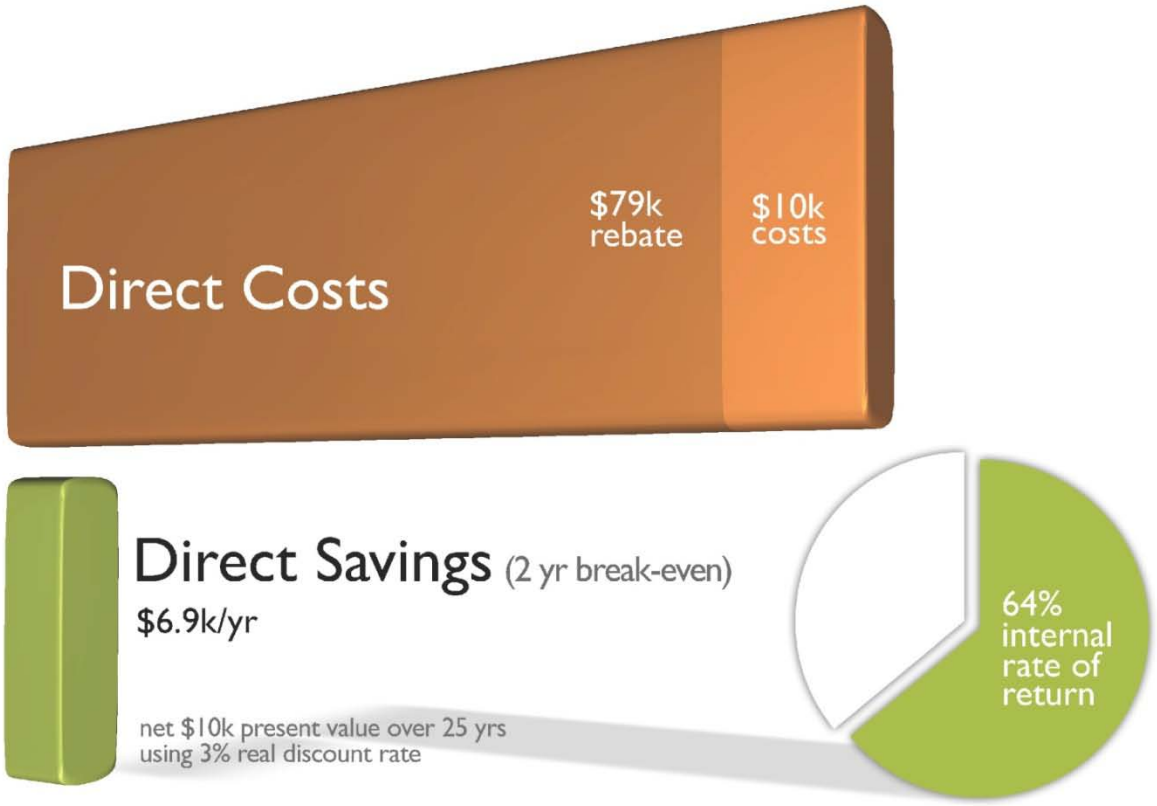




2004 Data

Water Economics

Stephen Epler Hall



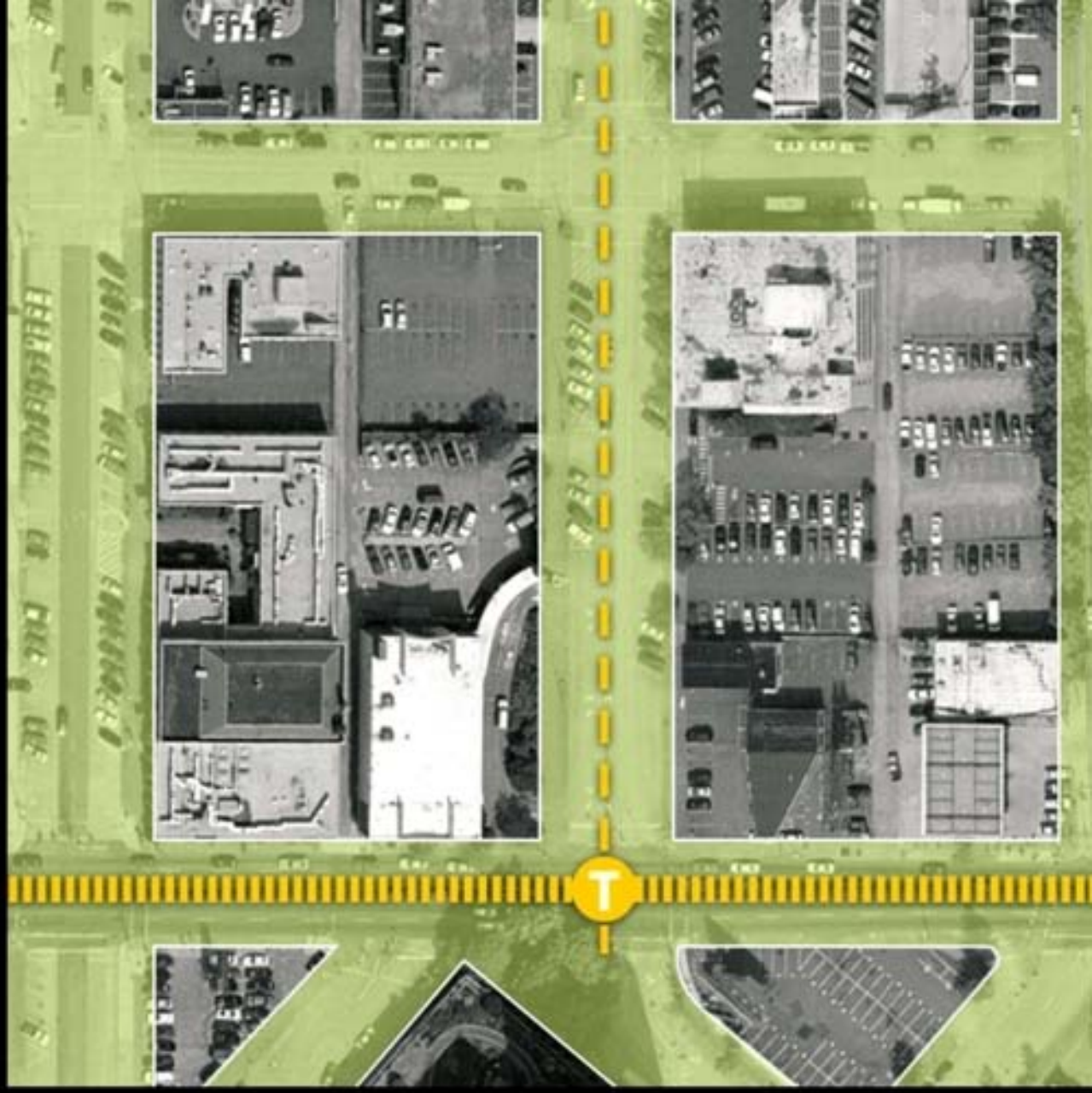
2004 Data

Water Economics

Stephen Epler Hall

MITHŪN

Public

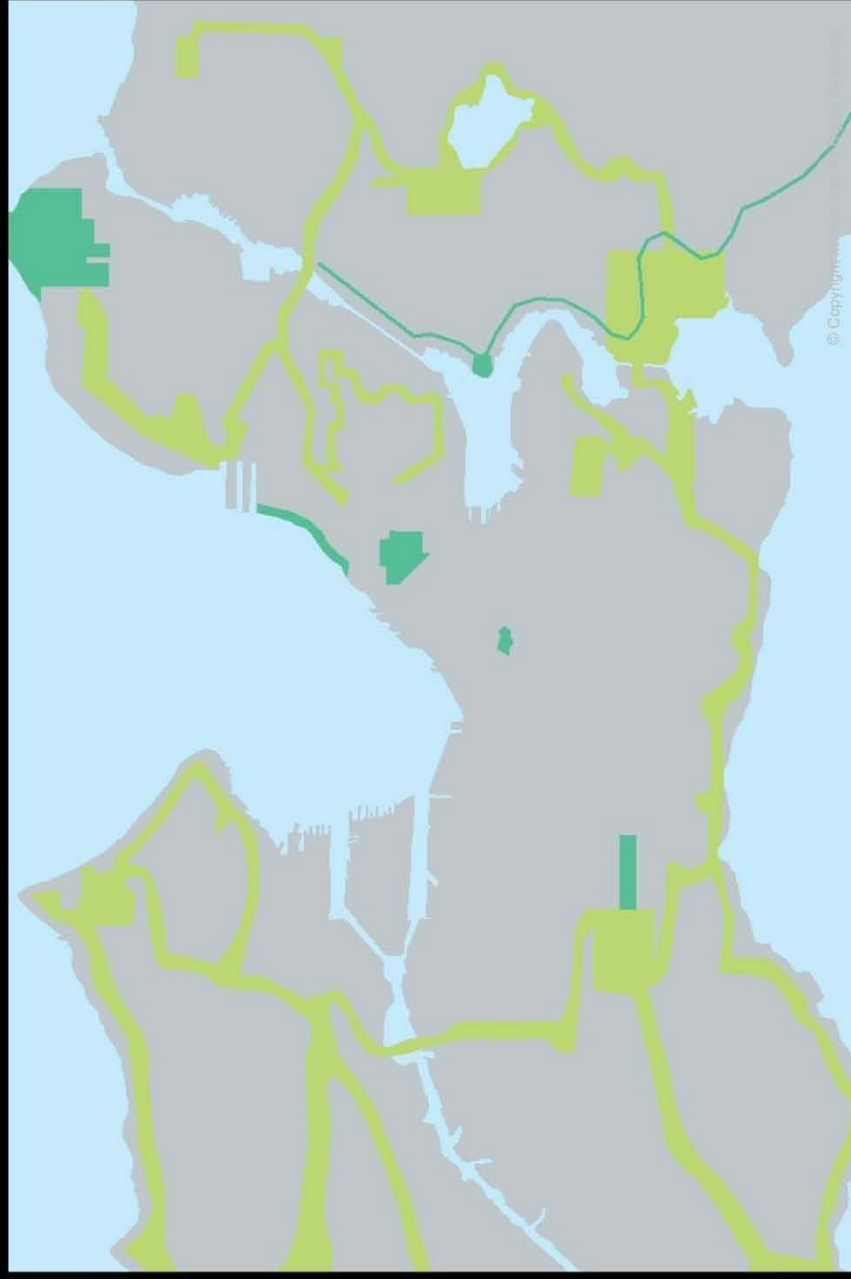


The Blue Ring

connecting places

Seattle's Open Space Strategy
For the Center City

MITHŪN



The Olmstead Plan
Seattle

MITHŪN

The Blue Ring
Seattle

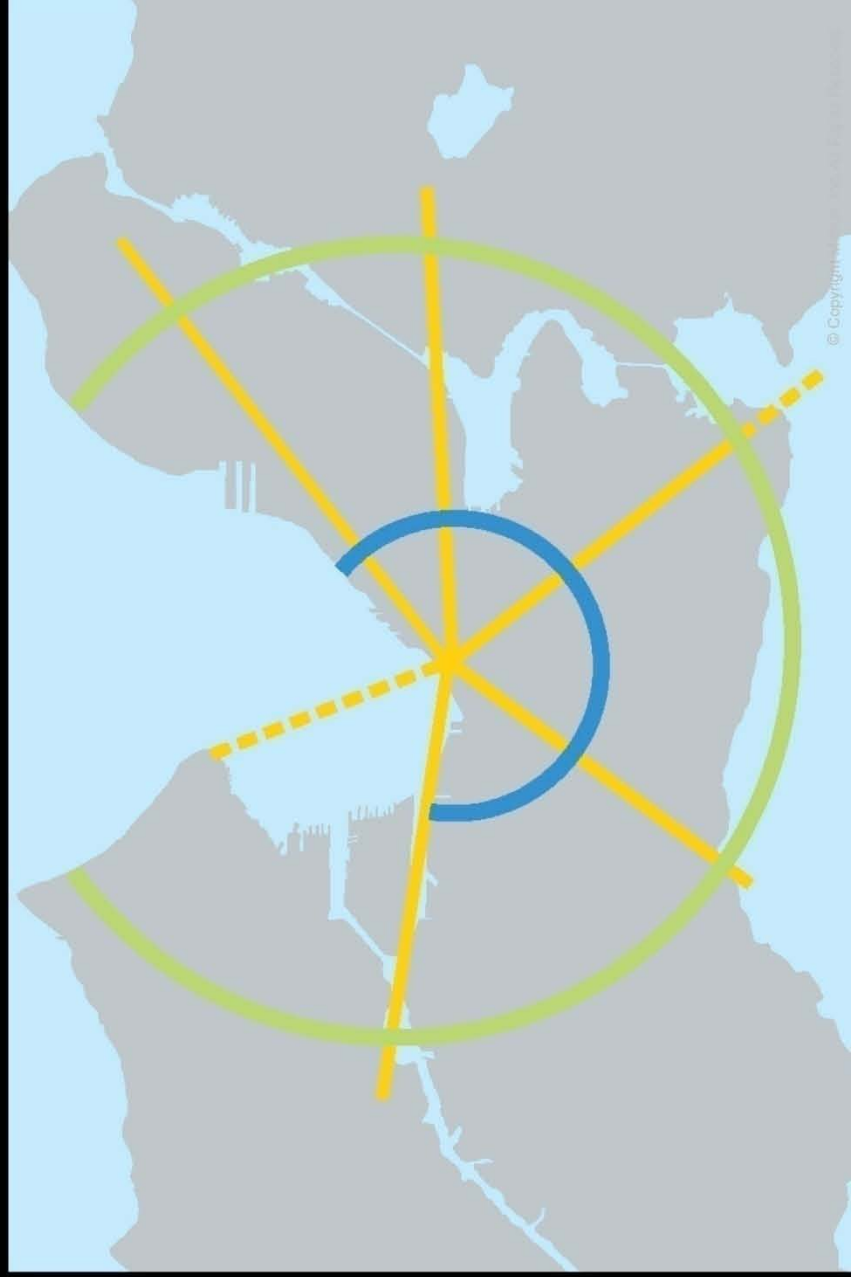
MITHŪN

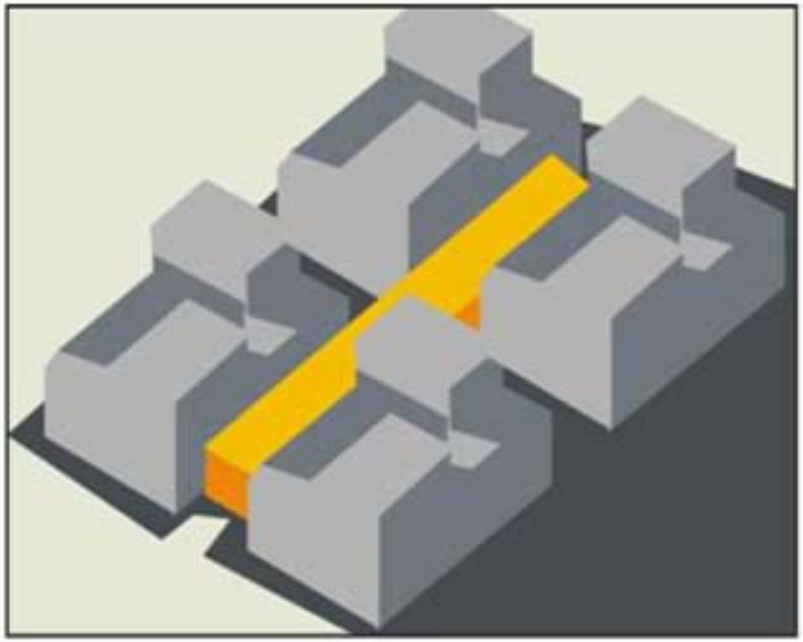
The Blue Ring
Seattle

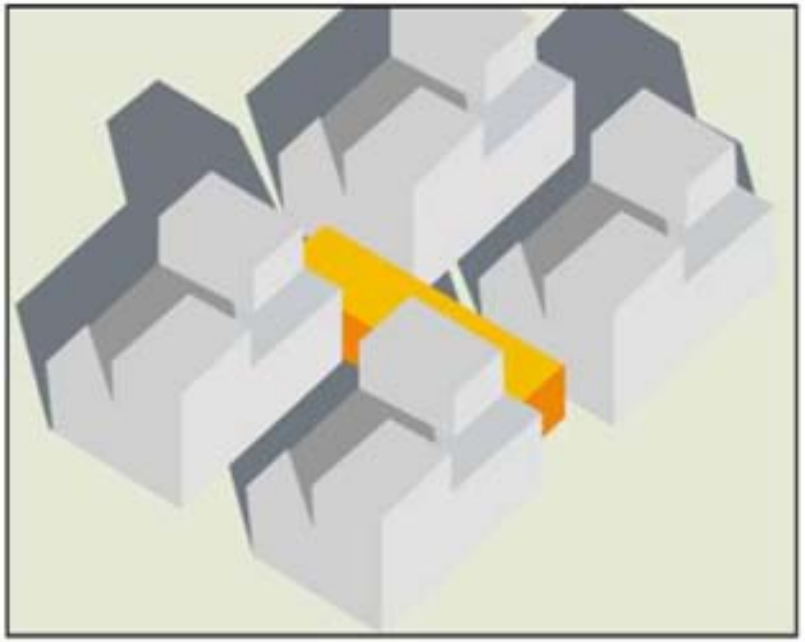
MITHŪN

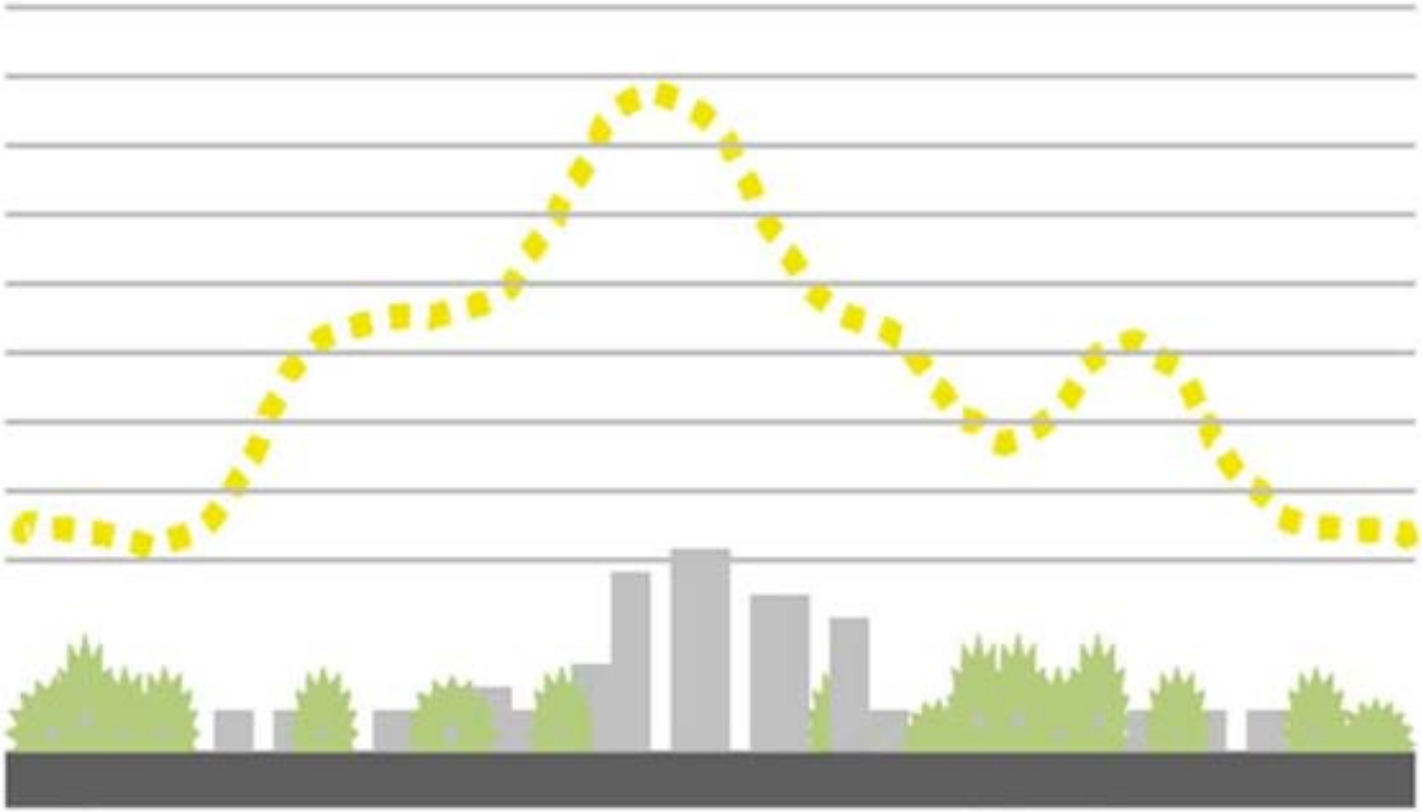
Hargreaves Associates

MITHŪN

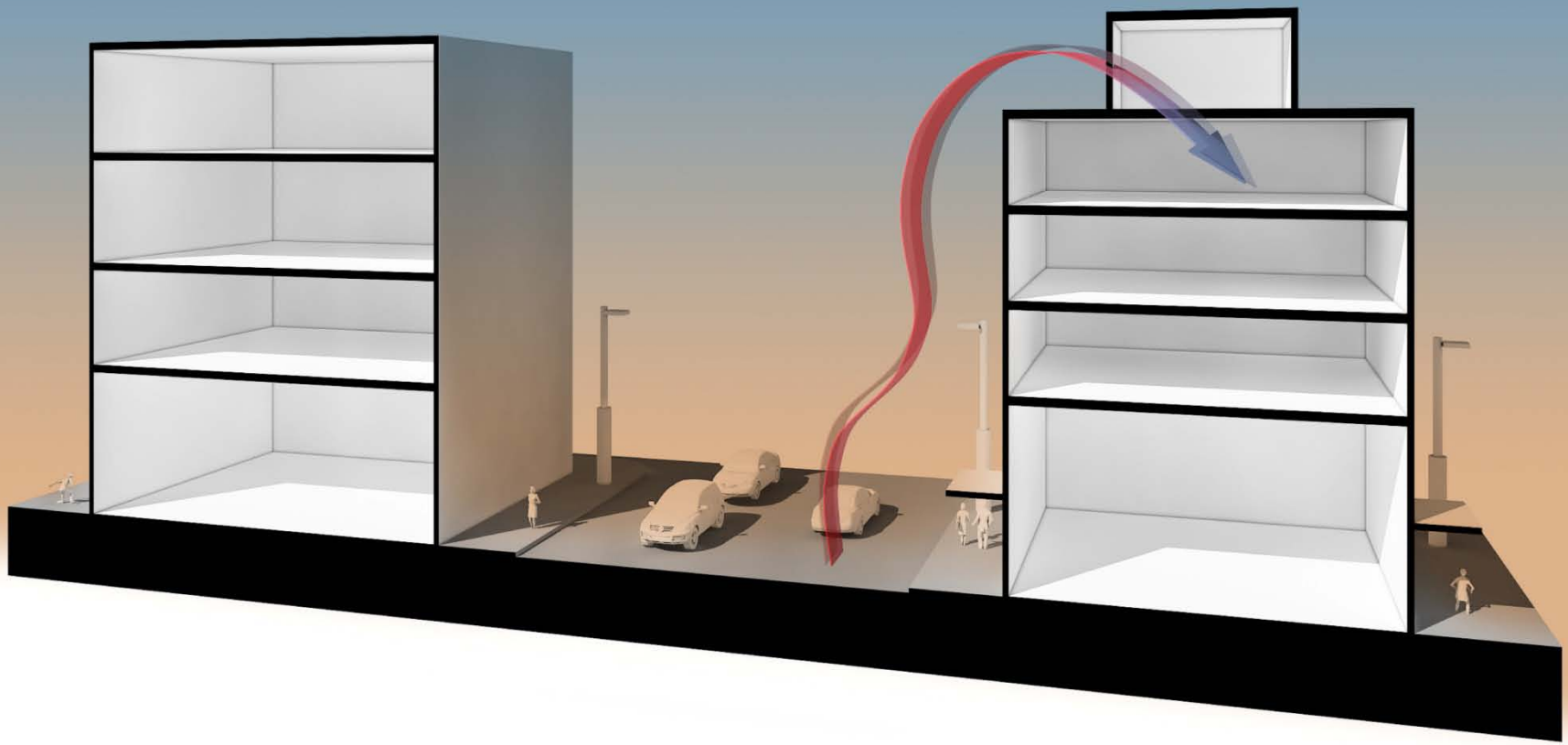








Urban Heat Island



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Vicinity Map
The Triangle

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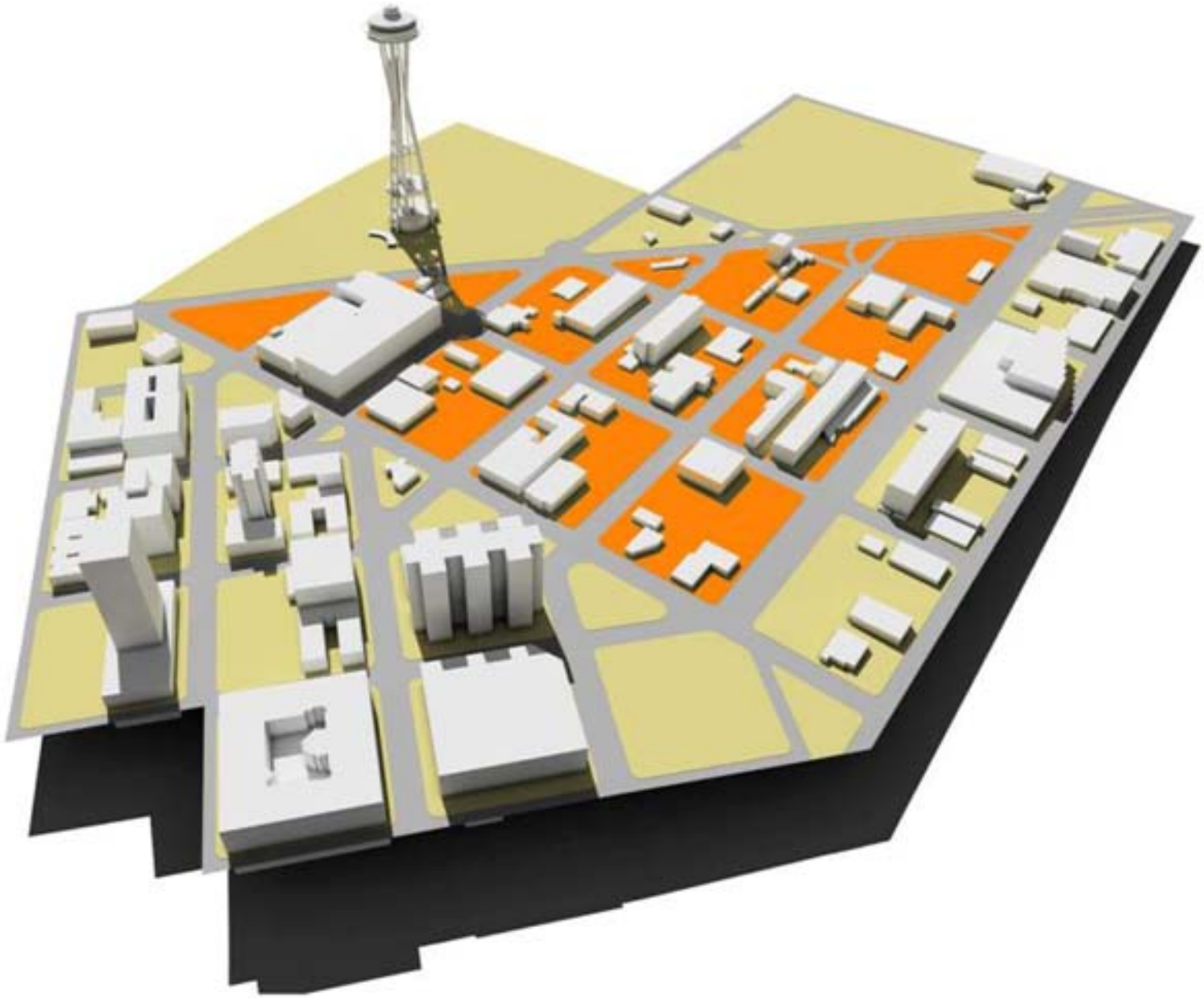

The Blue Ring

Taylor 28 Project

MITHŪN

The Blue Ring

Taylor 28 Project

MITHŪN

The Blue Ring

Taylor 28 Project

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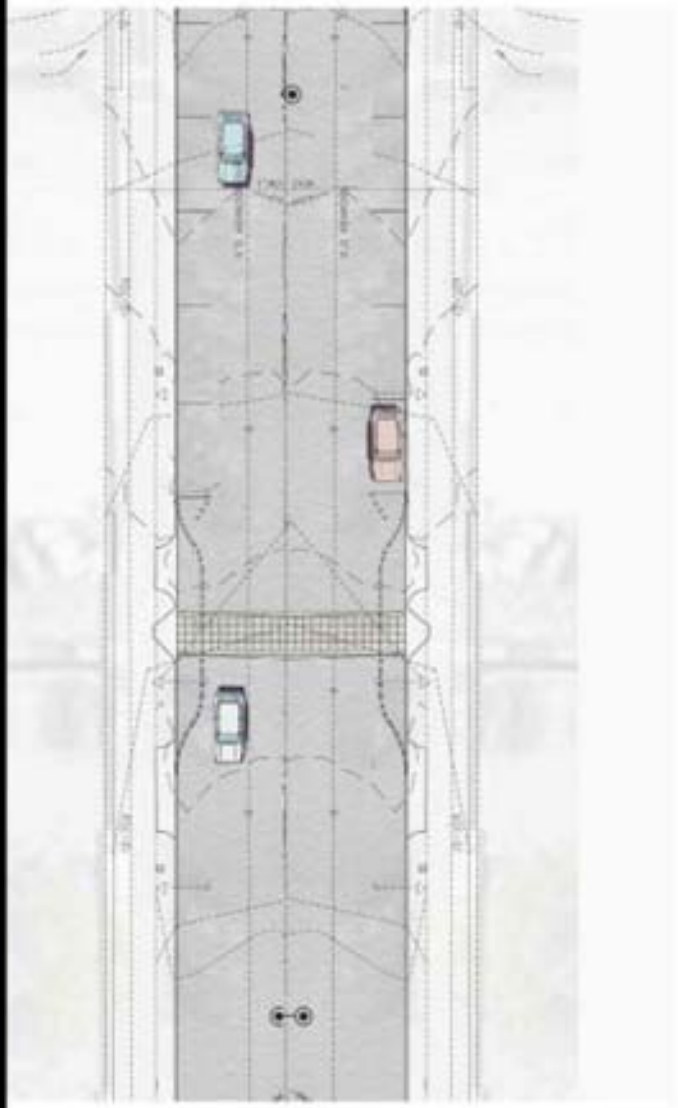
Traffic Focused



The Blue Ring
Taylor 28 Project

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People Focused

The Blue Ring
Taylor 28 Project

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Street Section
Before

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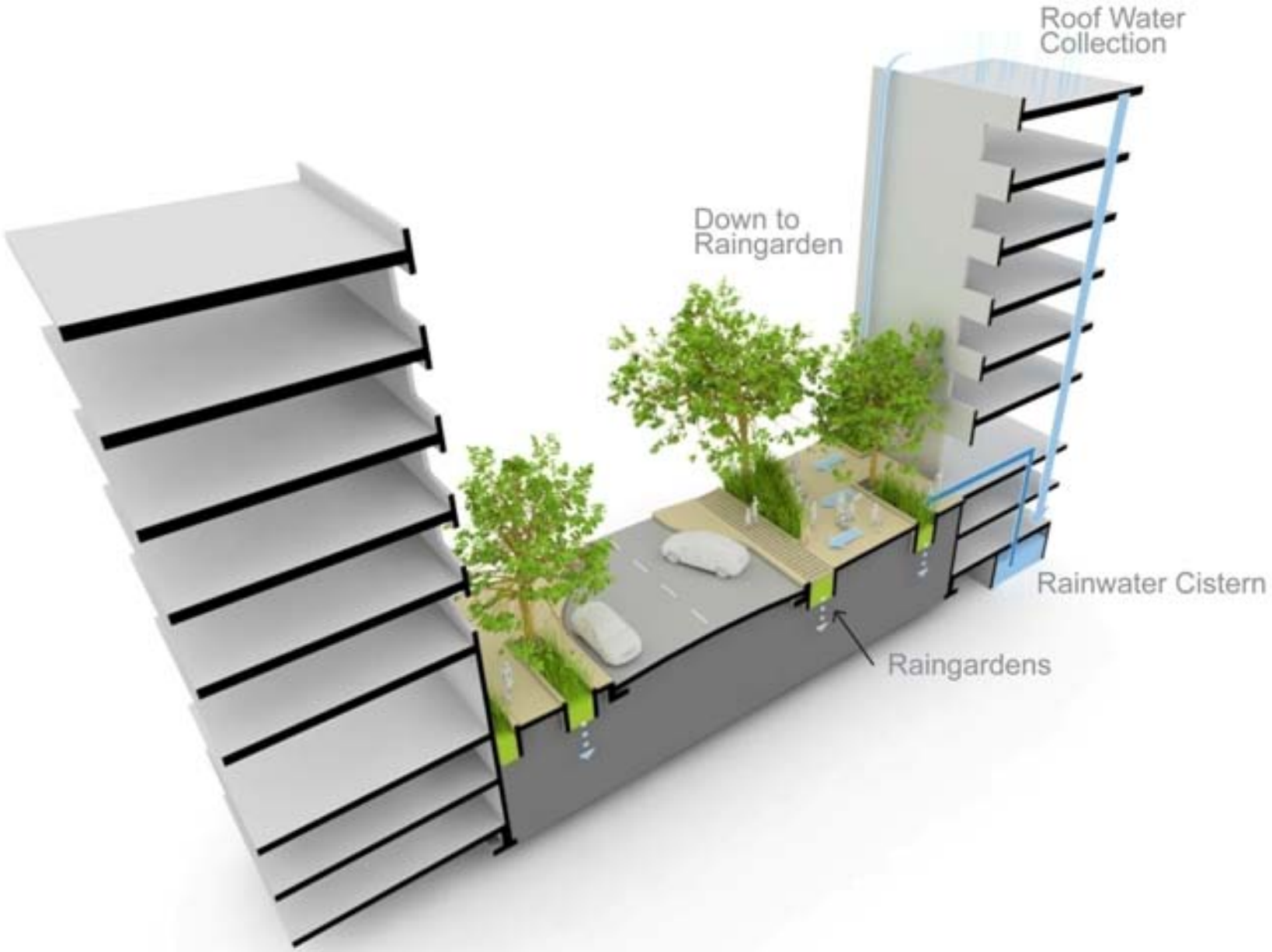

Street Section
Water Retension

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Private
+
Public

Lloyd Crossing Urban Design Plan

Portland, Oregon

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Lloyd Crossing Urban Design Plan

Portland, Oregon

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PDC
PORTLAND DEVELOPMENT COMMISSION

Sustainable Urban Design Plan:

Identify "green" infrastructure opportunities and synergies that can be realized at the neighborhood scale

Lloyd Crossing Signature Project:

Develop a conceptual design for a sustainable, financially feasible, mixed-use development project that will catalyze future private development in the district

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Coal Based Electrical Energy

Portland Lloyd District

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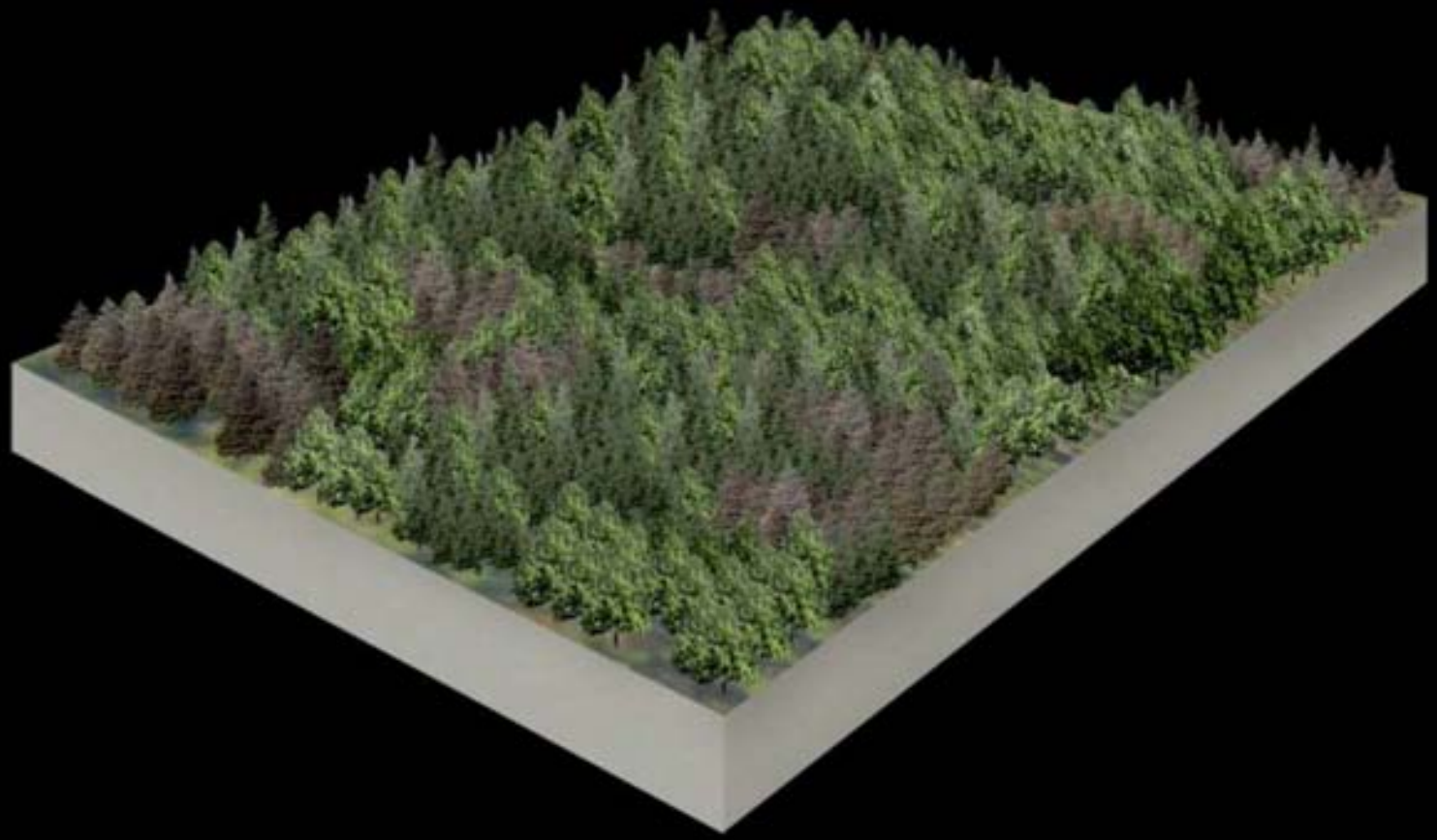
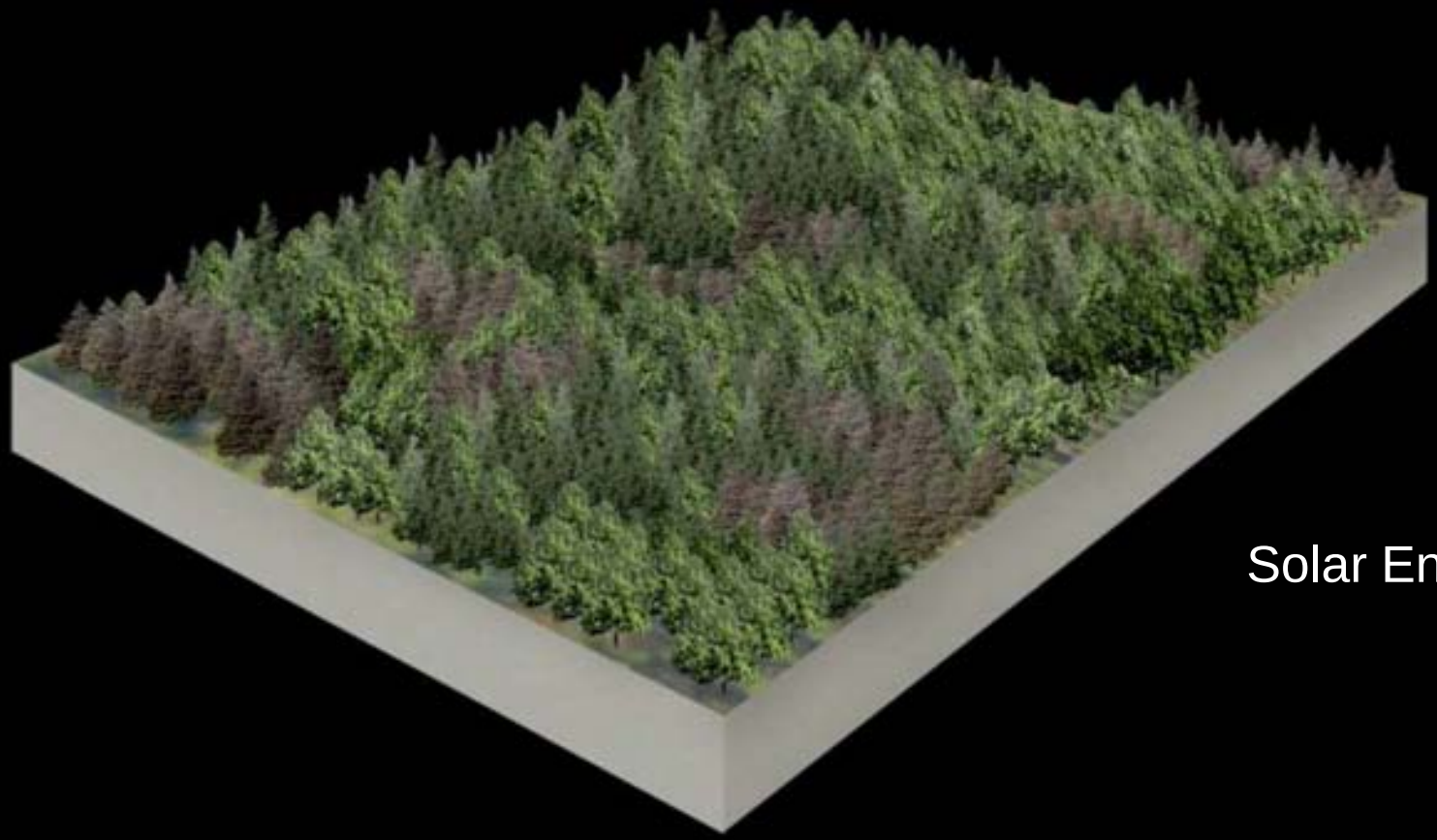


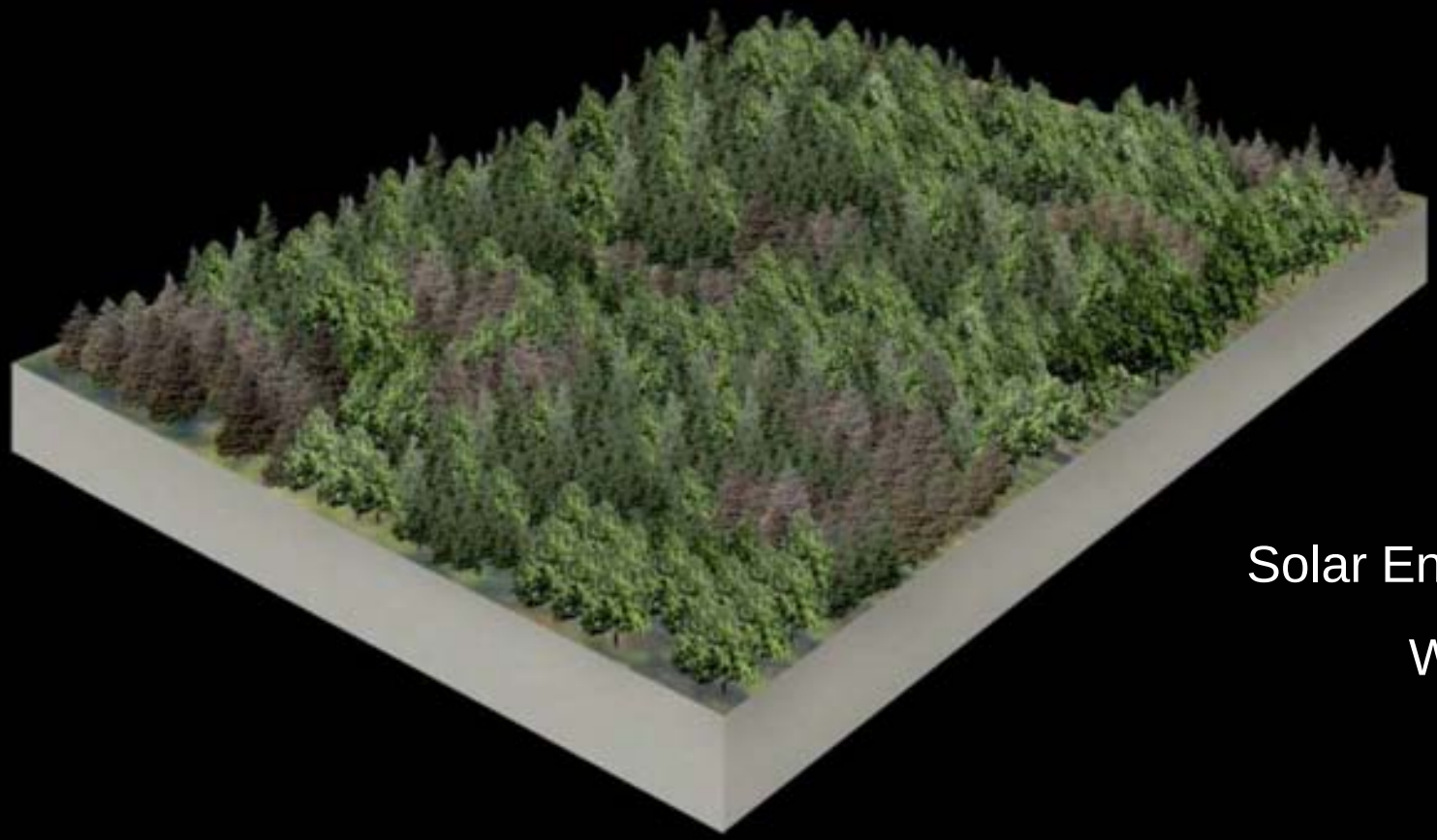
Predevelopment Metrics



Solar Energy

Predevelopment Metrics

MITHUN

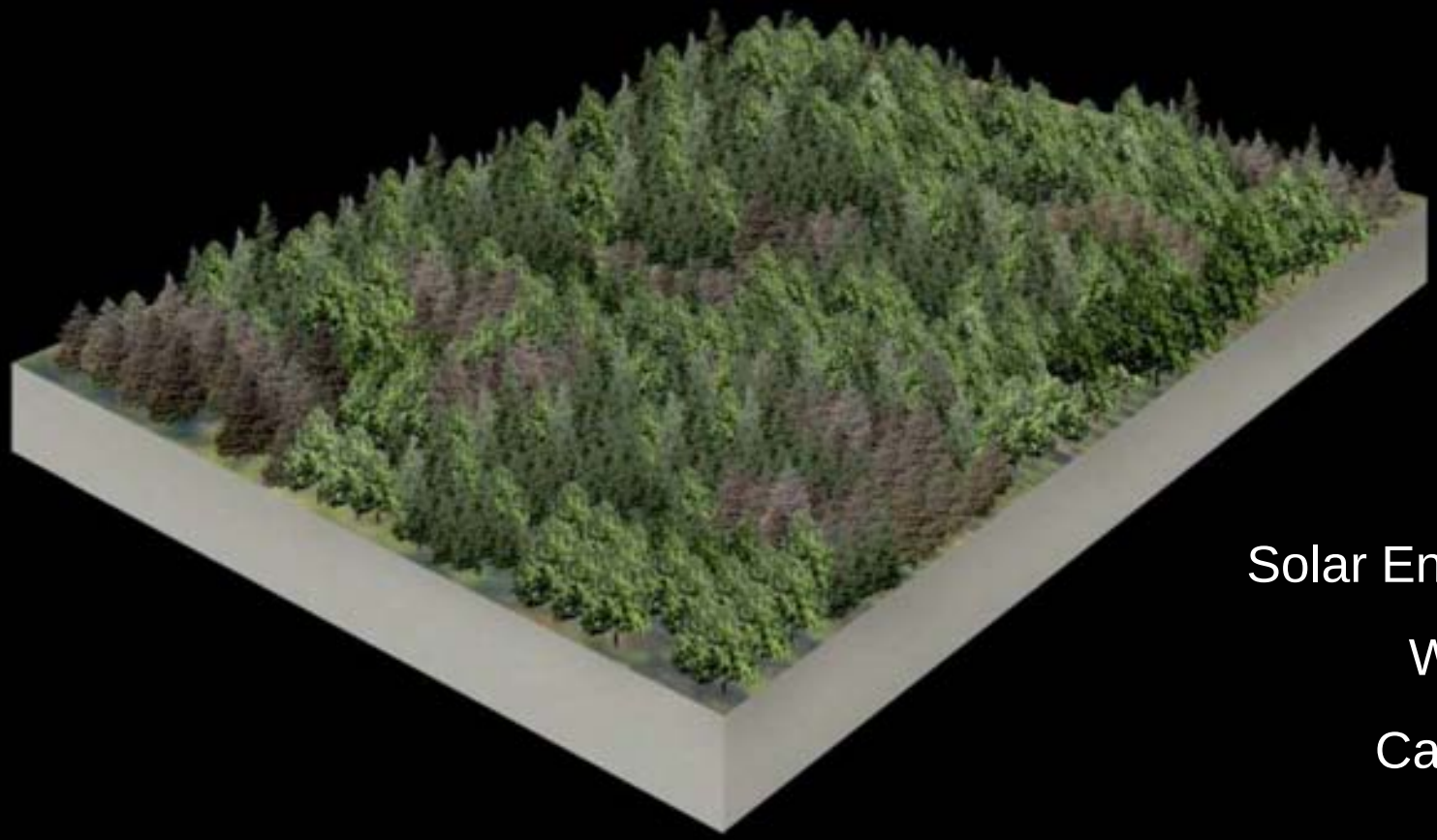


Solar Energy

Water

Predevelopment Metrics

MITHUN

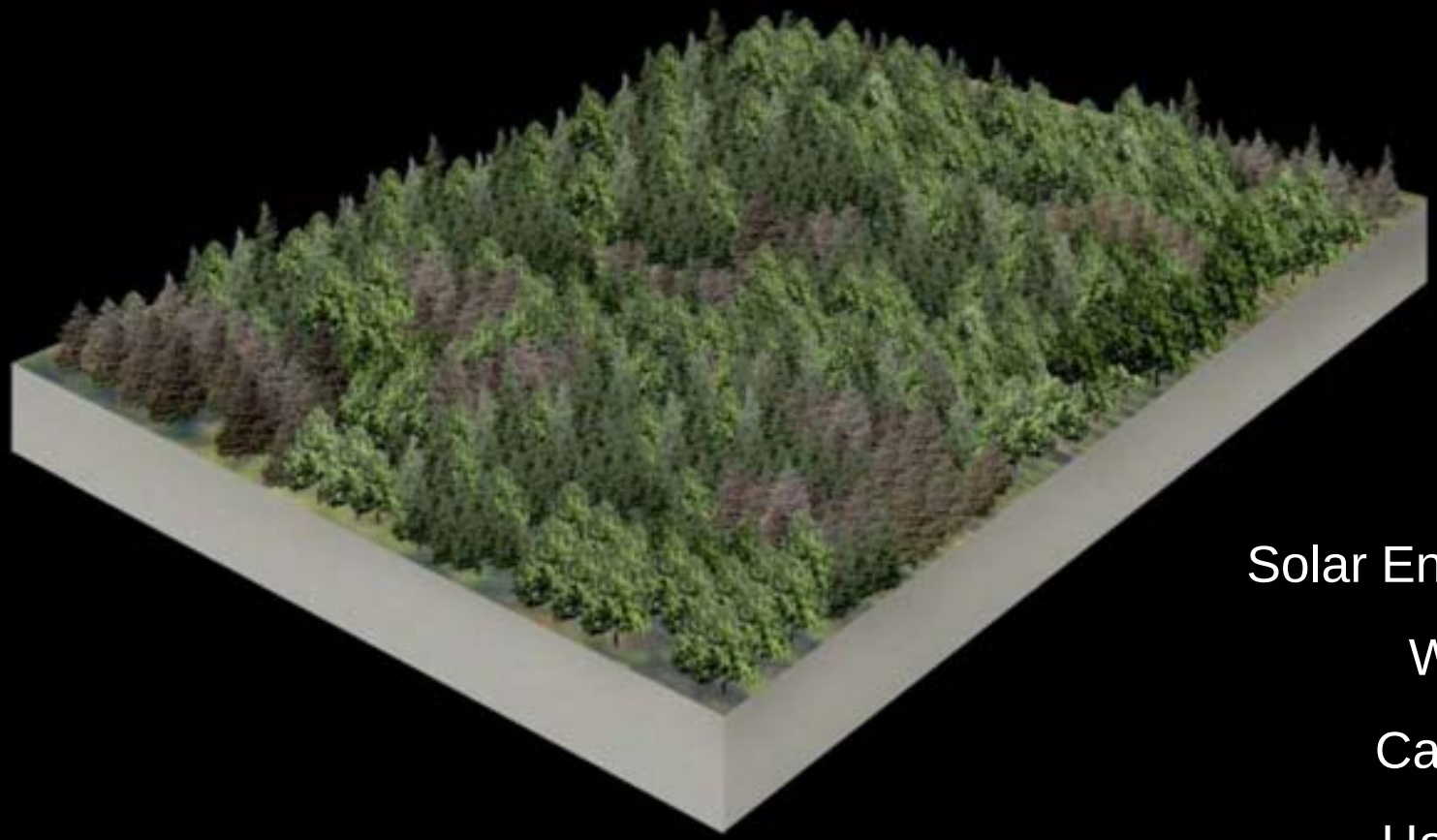


Solar Energy

Water

Carbon

Predevelopment Metrics



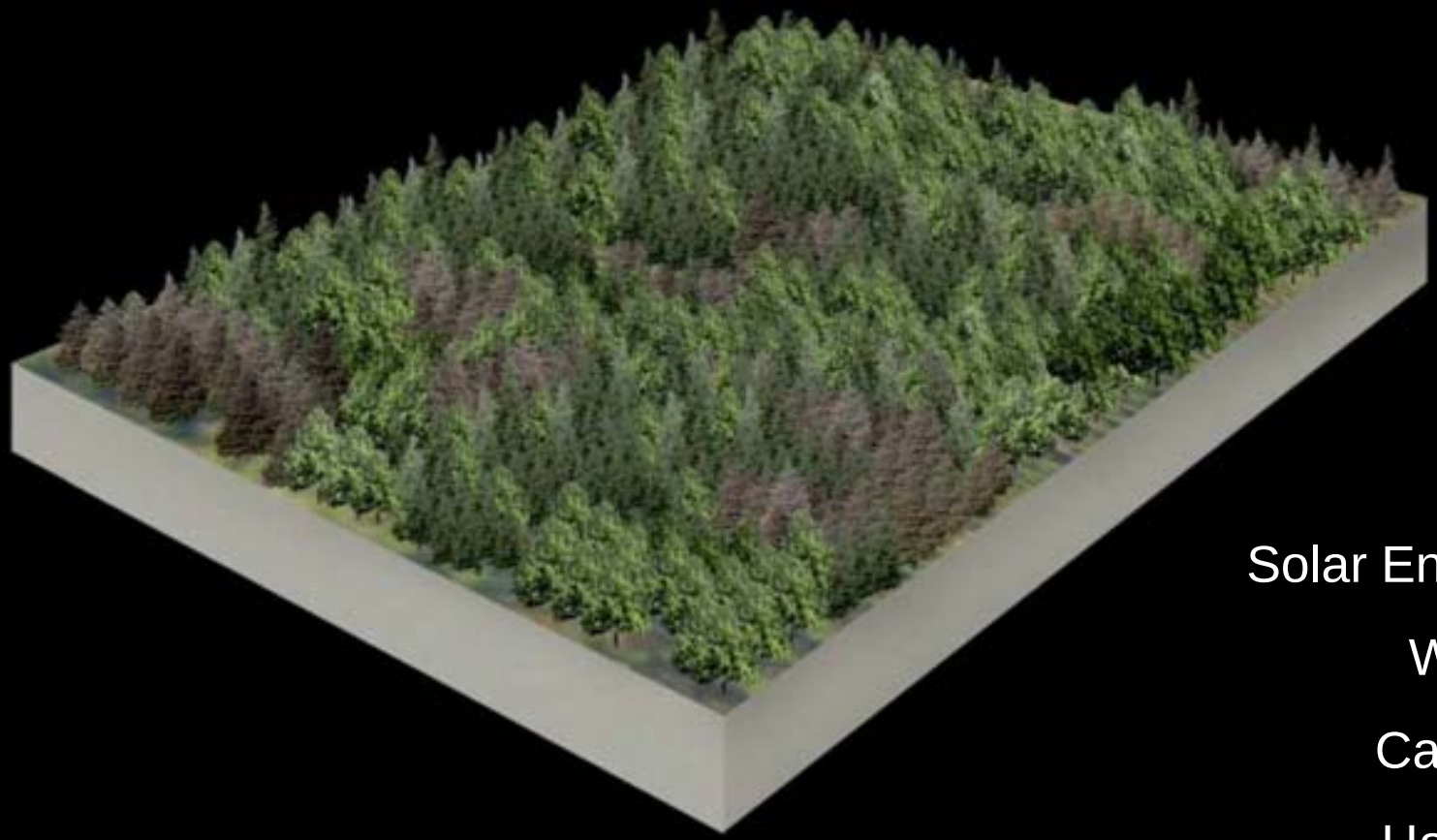
Solar Energy

Water

Carbon

Habitat

Predevelopment Metrics



Solar Energy

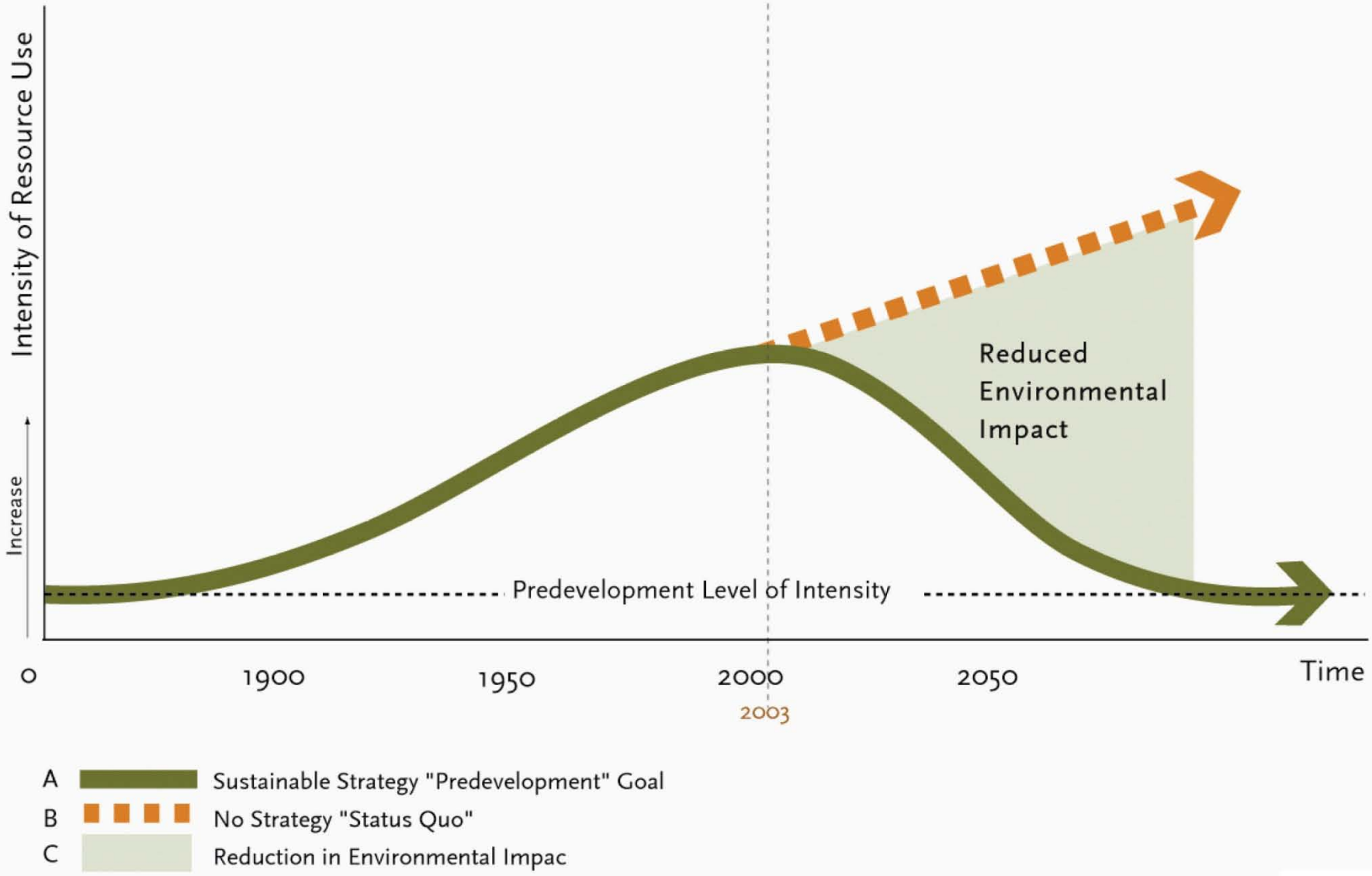
Water

Carbon

Habitat

Materials

Predevelopment Metrics



Lloyd Crossing Sustainable Urban Design Plan

Portland, OR

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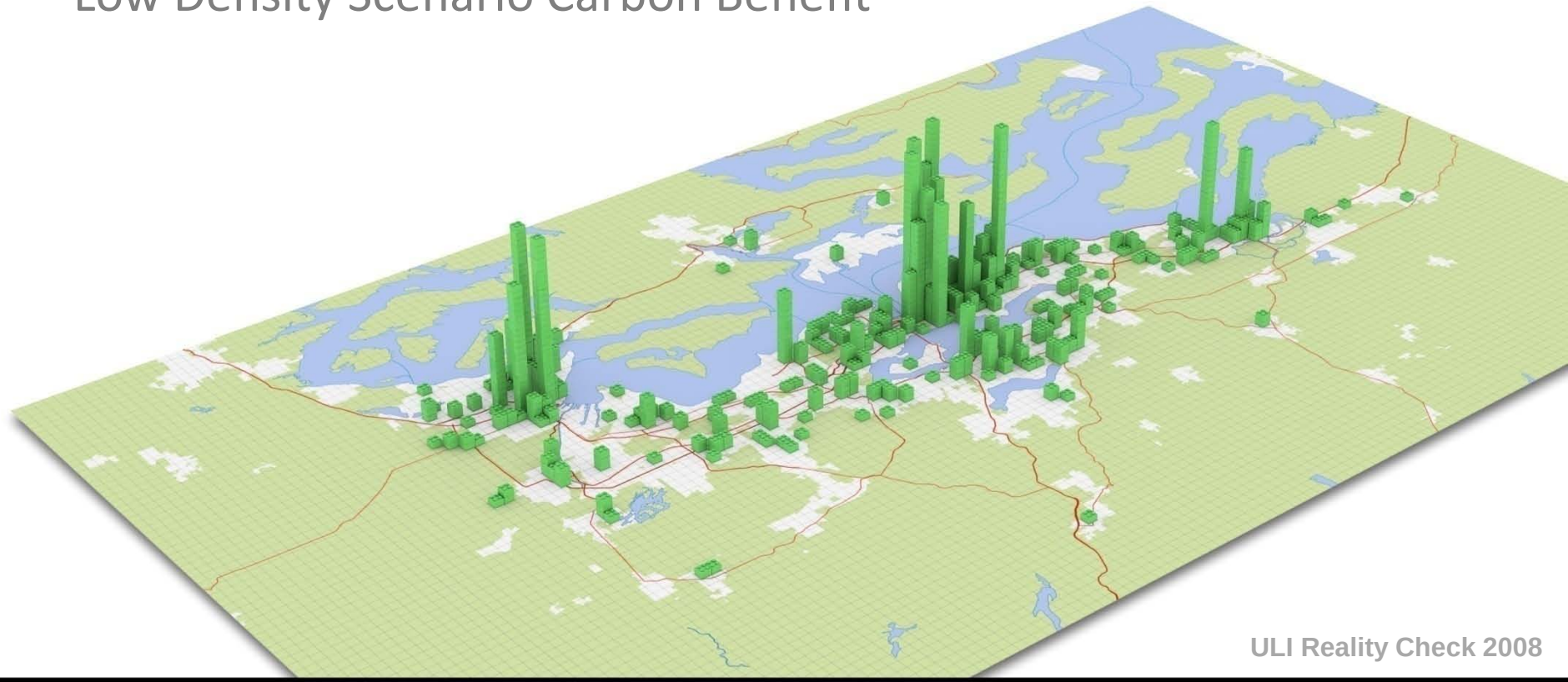
Maximize Density

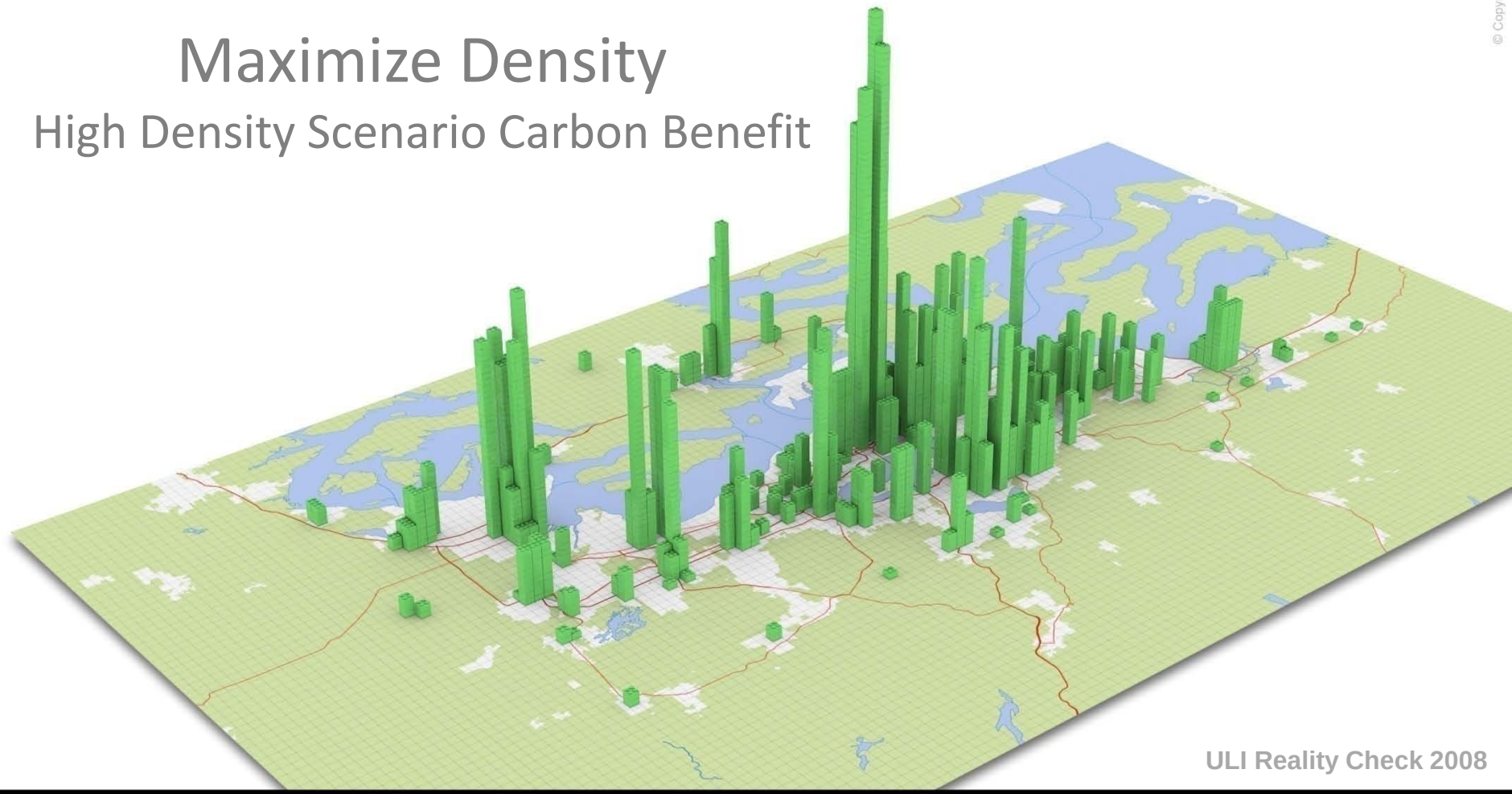
Low Density Scenario Carbon Benefit



ULI Reality Check 2008

Maximize Density

High Density Scenario Carbon Benefit



ULI Reality Check 2008

Puget Sound Region in 2040

Greenhouse Gas Reductions from Land Use Actions

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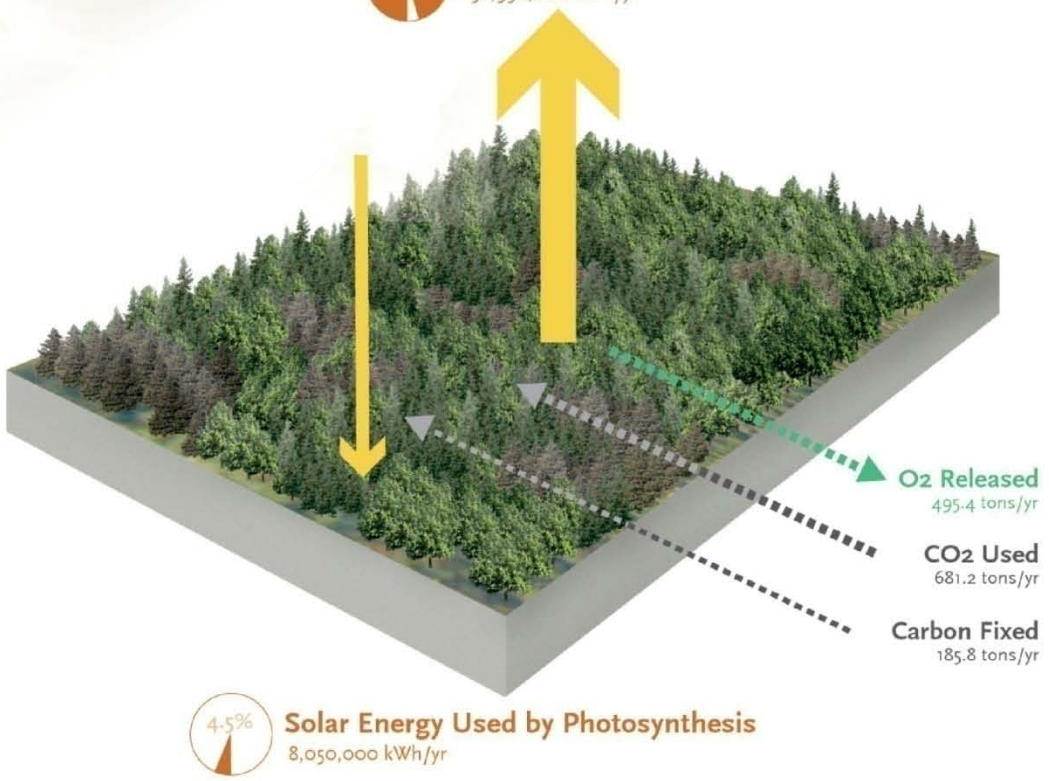
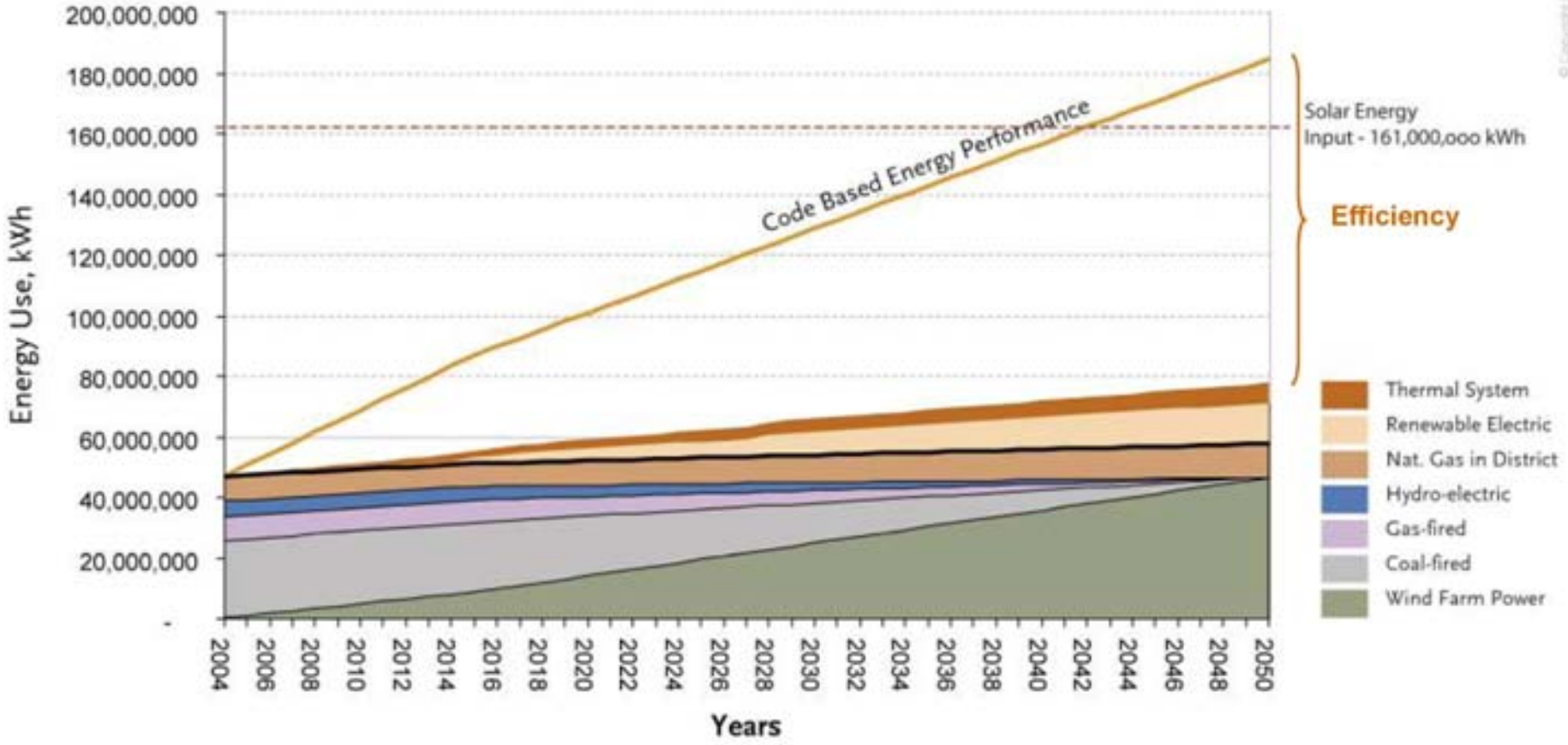
Pre-development Energy Use Conditions

100% **Solar Energy Input**
161,006,000 kWh/yr



Carbon Balance
Net removal from atmosphere: 681.2 tons/yr

Lloyd Crossing Sustainable Urban Design Plan
Portland, OR



Energy

2050 Energy Path

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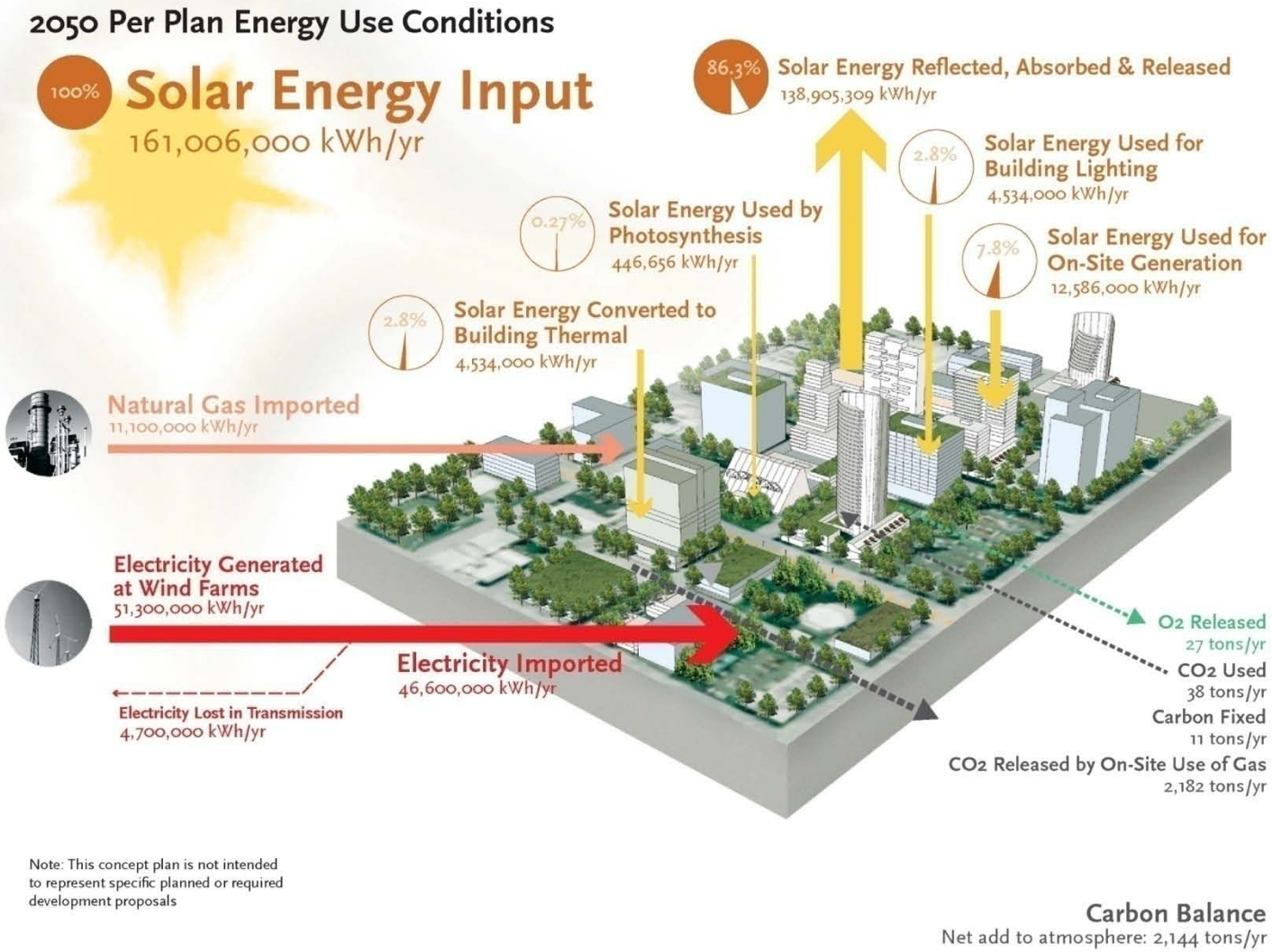

Lloyd Crossing Sustainable Urban Design Plan

Portland, OR

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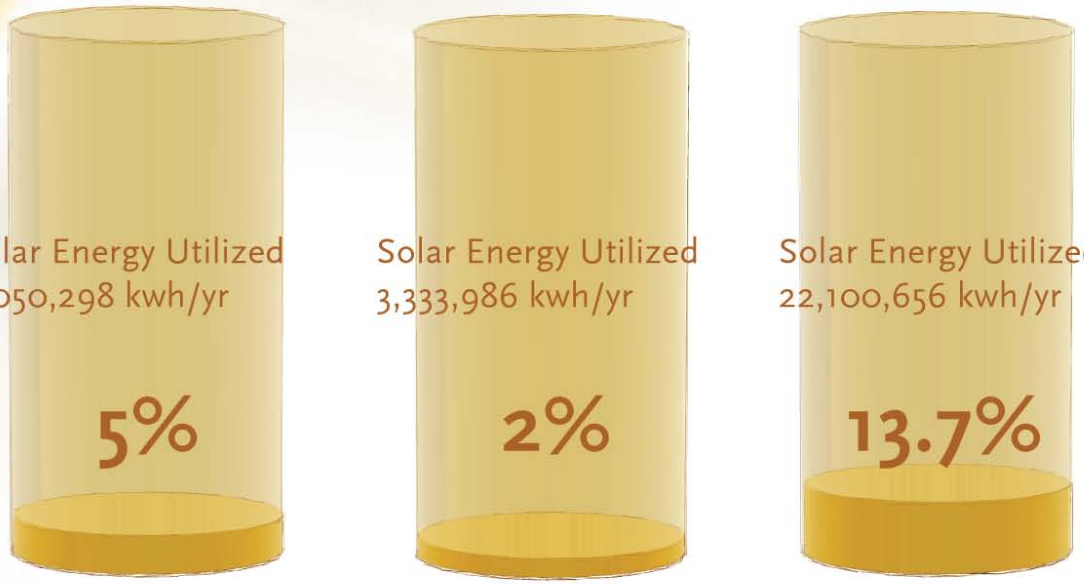
Solar Energy Input

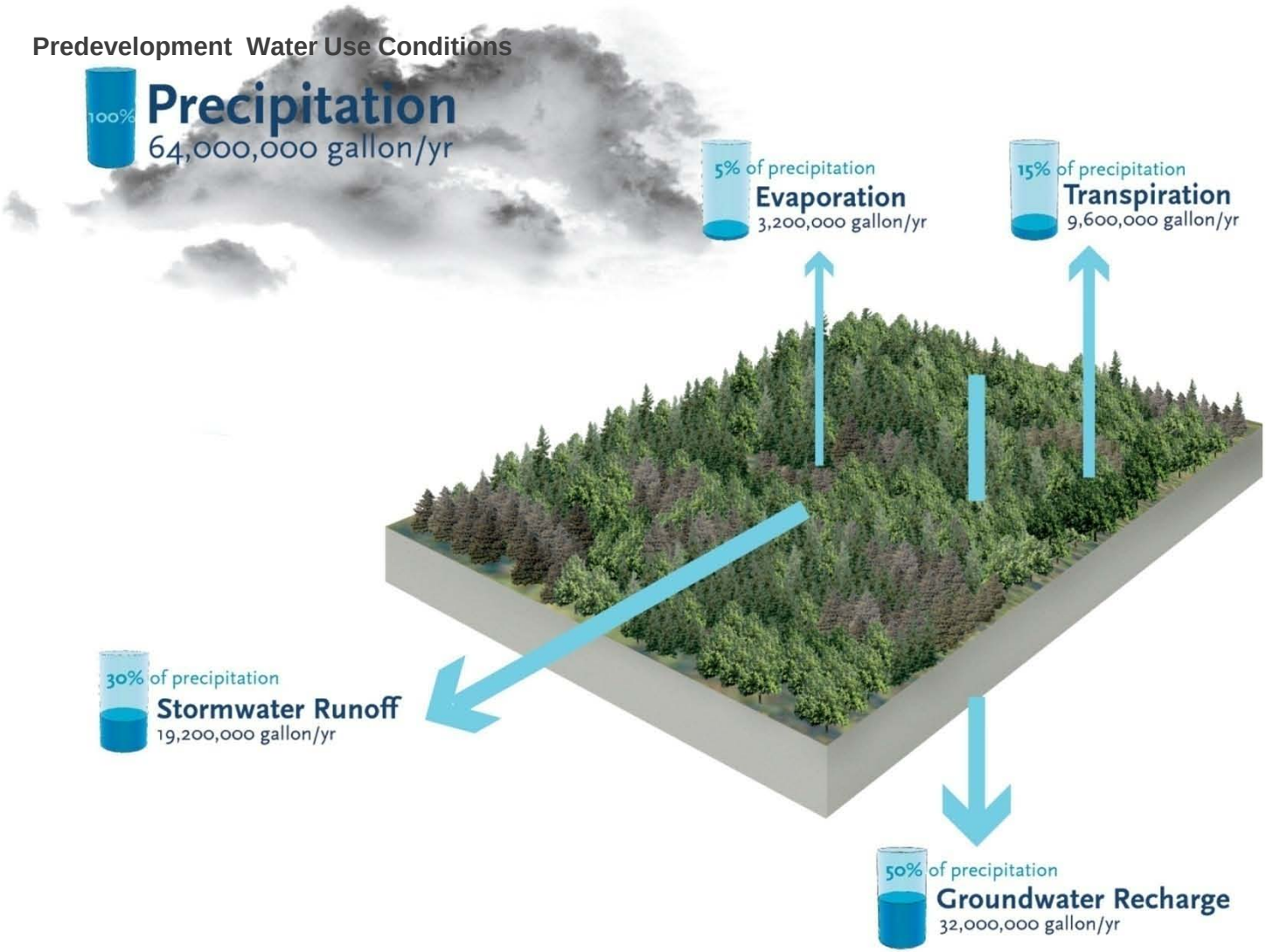
161,006,000 kWh/yr

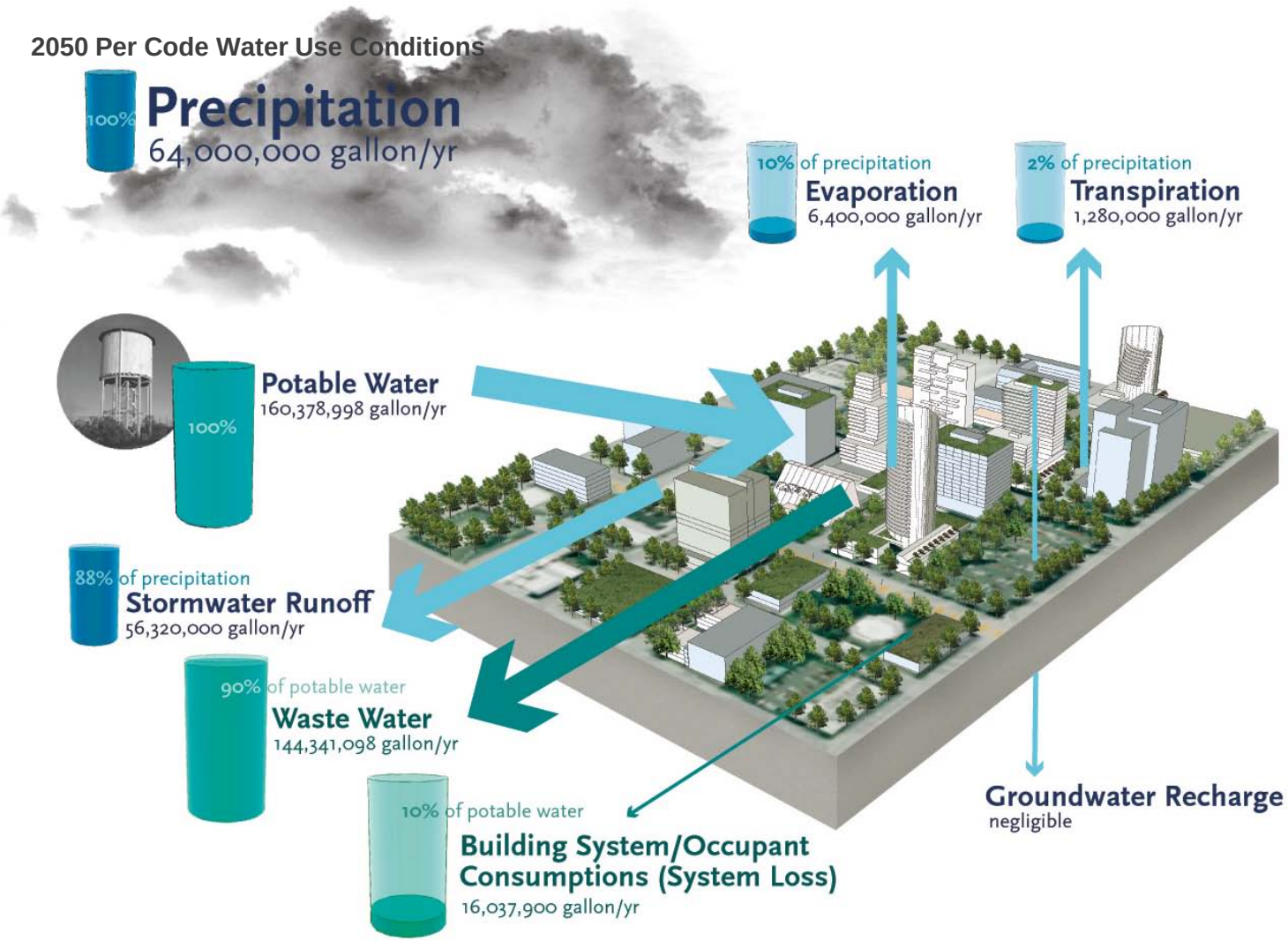
Future photovolltaic efficiencies may improve utilization factor.



Carbon Balance

Predevelopment Water Use Conditions

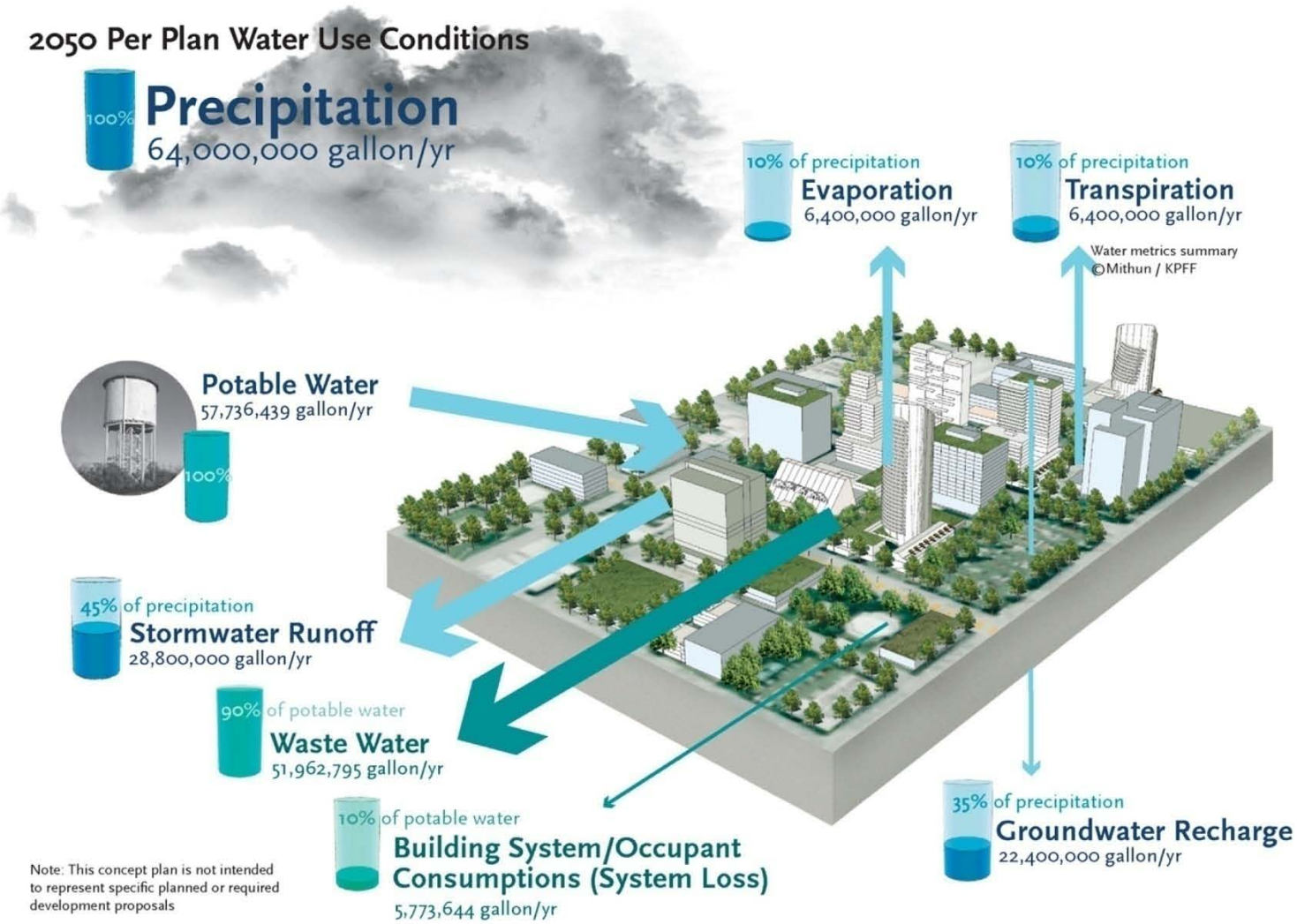




Lloyd Crossing Sustainable Urban Design Plan

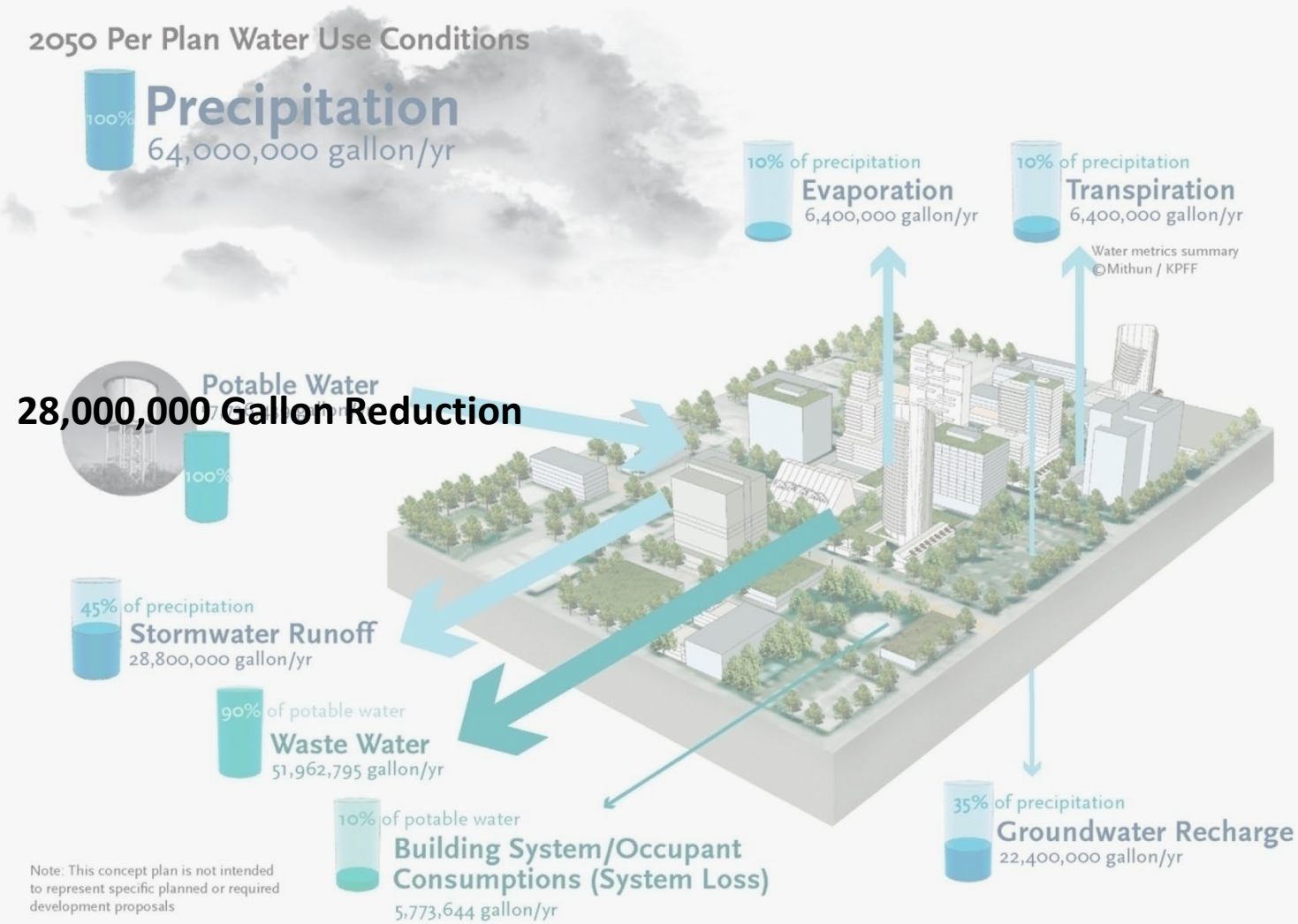
Portland, OR

MITHUN



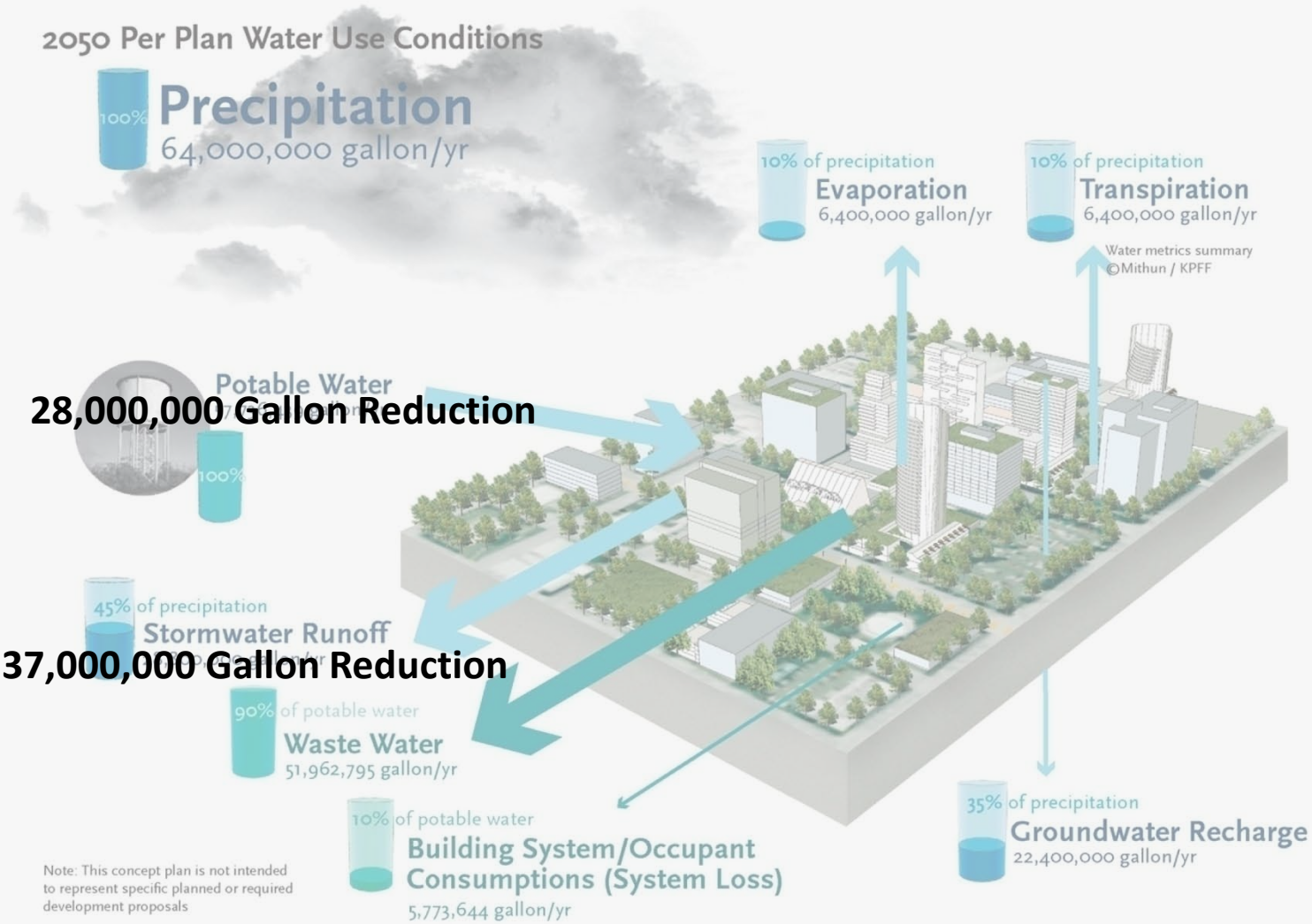
Lloyd Crossing Sustainable Urban Design Plan

Portland, OR



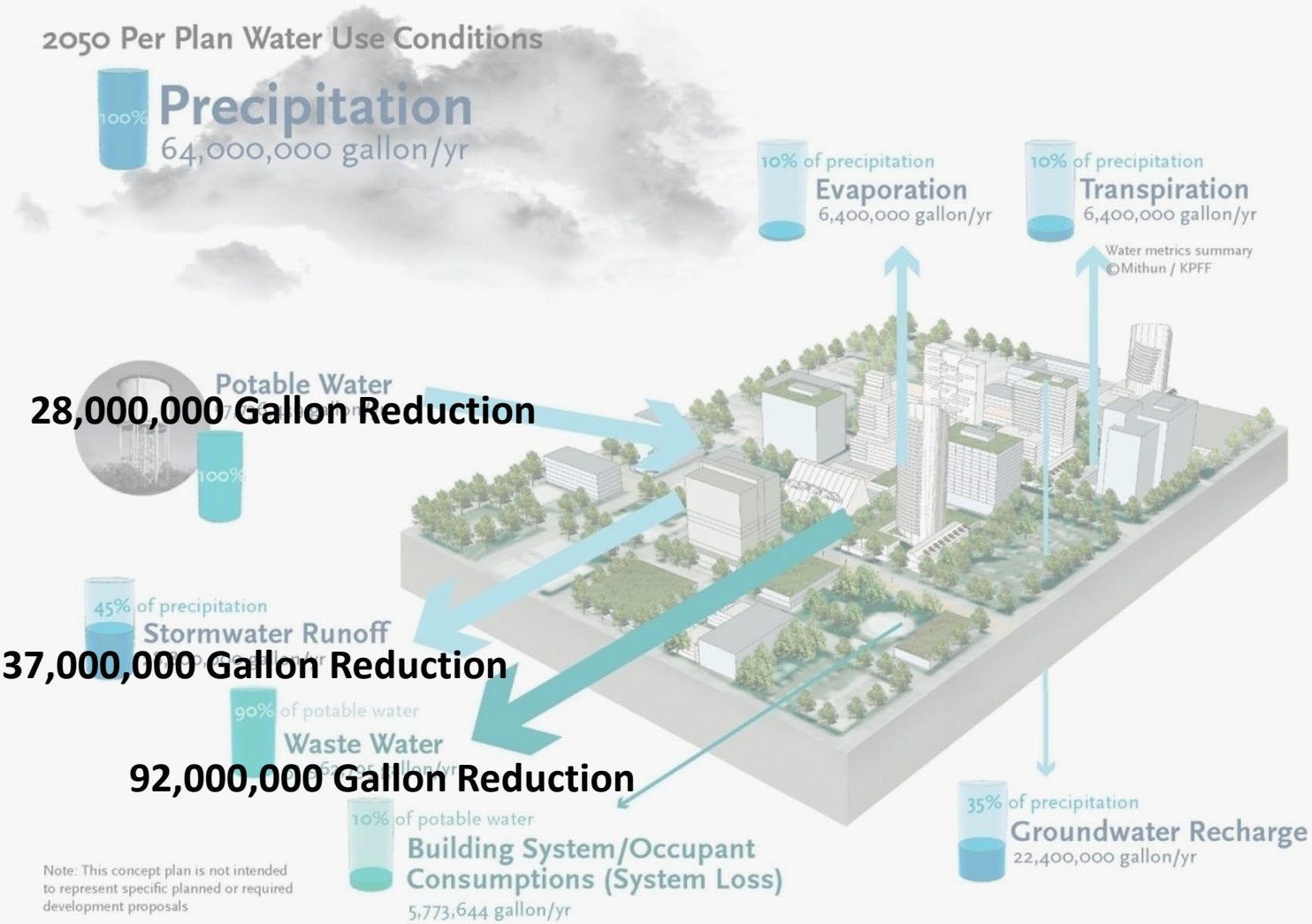
Lloyd Crossing Sustainable Urban Design Plan
Portland, OR

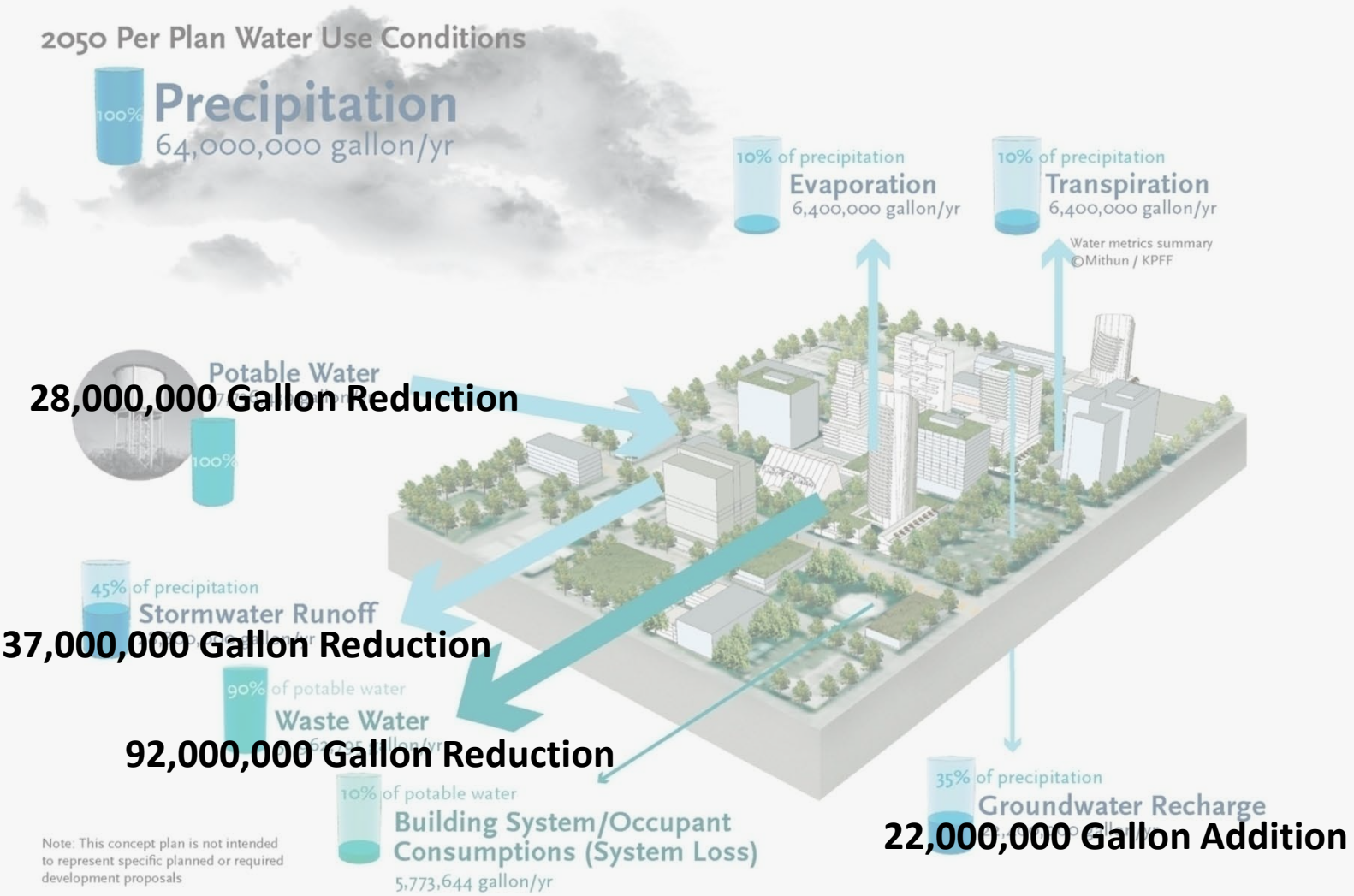
MITHŪN



Lloyd Crossing Sustainable Urban Design Plan

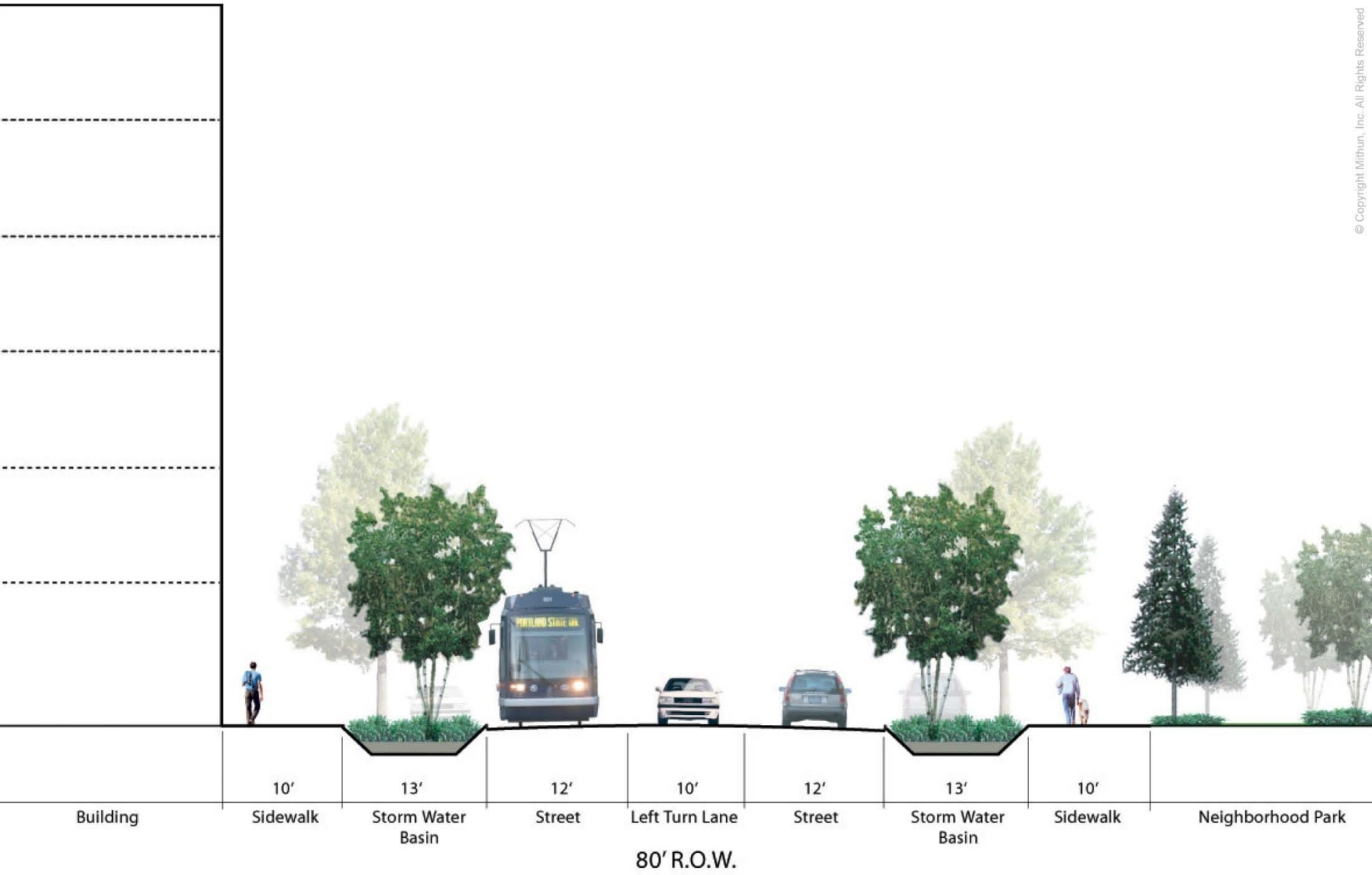
Portland, OR





Lloyd Crossing Sustainable Urban Design Plan
Portland, OR

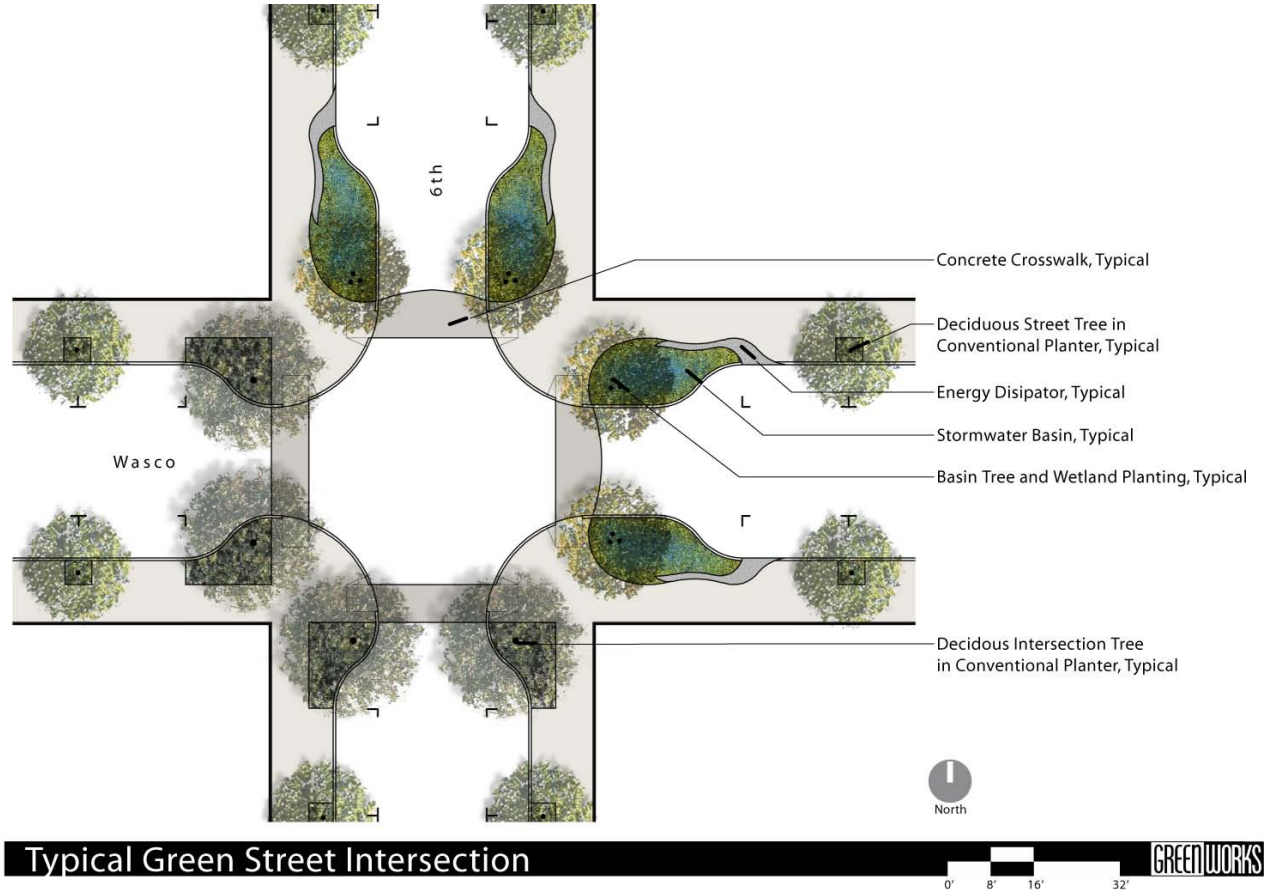
MITHŪN



Lloyd Crossing Sustainable Urban Design Plan

Portland, OR

MITHUN



Typical Green Street Intersection

GREENWORKS

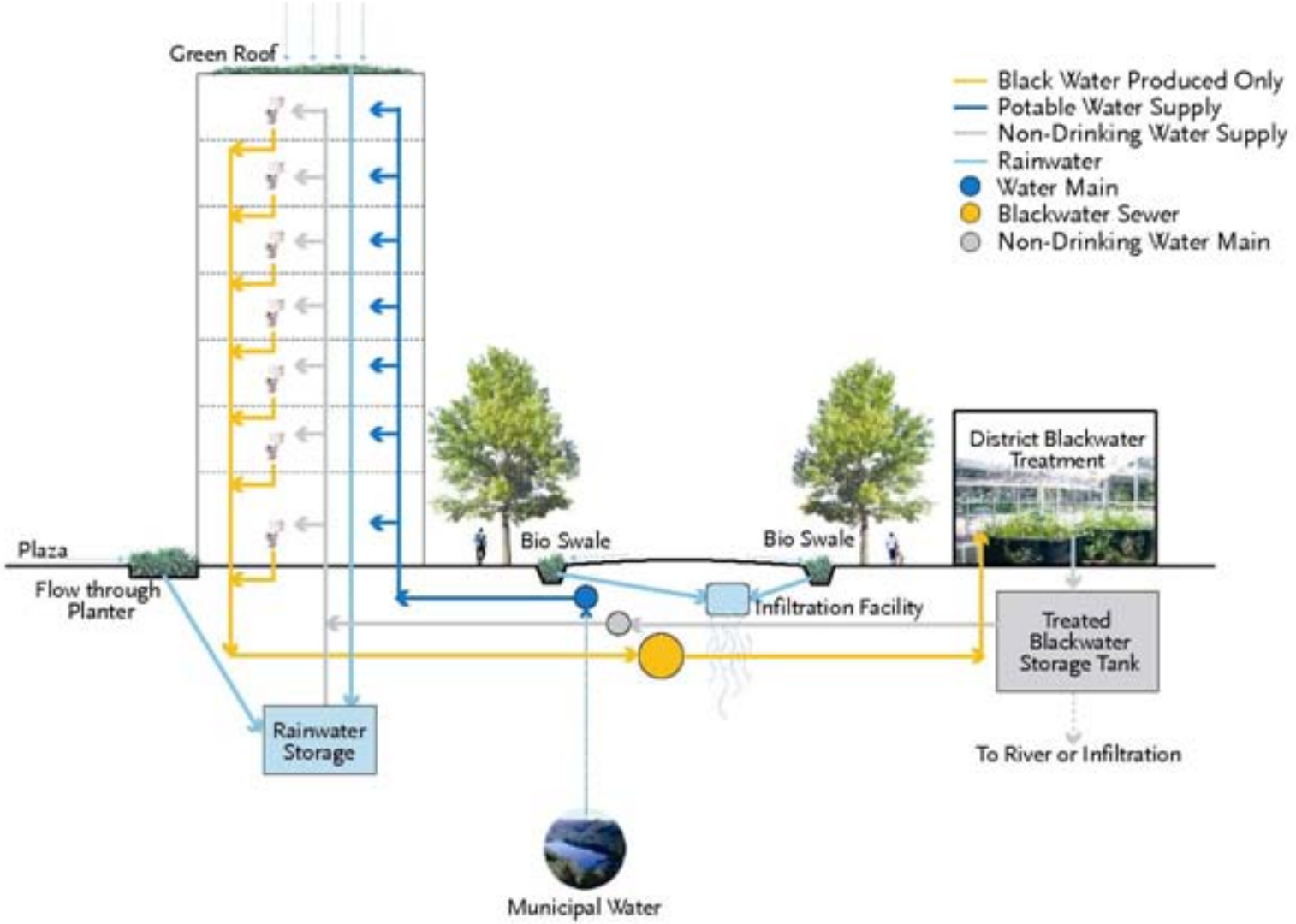
Lloyd Crossing
Raingardens

MITHUN

Lloyd Crossing Sustainable Urban Design Plan

2050 – Habitat per Plan

MITHŪN

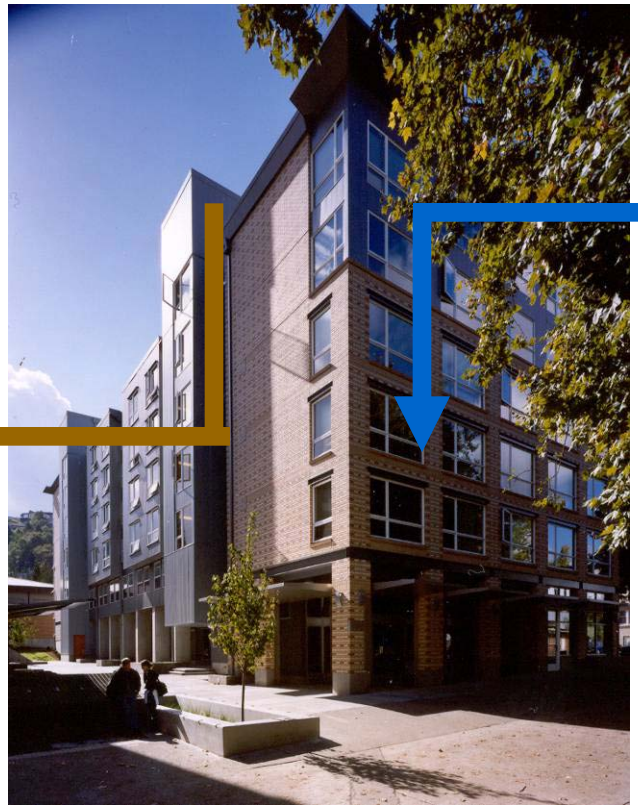


Central Water Park
Water Treatment

GREENWORKS
MITHŪN

0.6 cents/gallon

To Columbia Boulevard Wastewater Treatment Plant



From Bull Run Watershed

0.3 cents/gallon

2004 Data

Lloyd District
Water Costs

Strategy/Potable Water Demand (gallon/year)

A/166,000,000 (per code buildout)	B/116,000,000	C/70,000,000	D/70,000,000	E/64,000,000	F/0
	30%	58%	58%	62%	100% Potable Water Deduction
	30% Water Conservation	30% Water Conservation 100% Non-Potable thru Rainwater Harvesting (Pub &Priv.)	30% Water Conservation 100% Non-Potable thru Rainwater Harvesting (Priv.) & Greywater Re-Use	30% Water Conservation 100% Non-Potable thru Rainwater Harvesting (Priv.) & Blackwater Re-Use	30% Water Conservation 100% Potable thru Rainwater Harvesting (Pub & Priv.) 100% Non-Potable thru Blackwater Re-Use

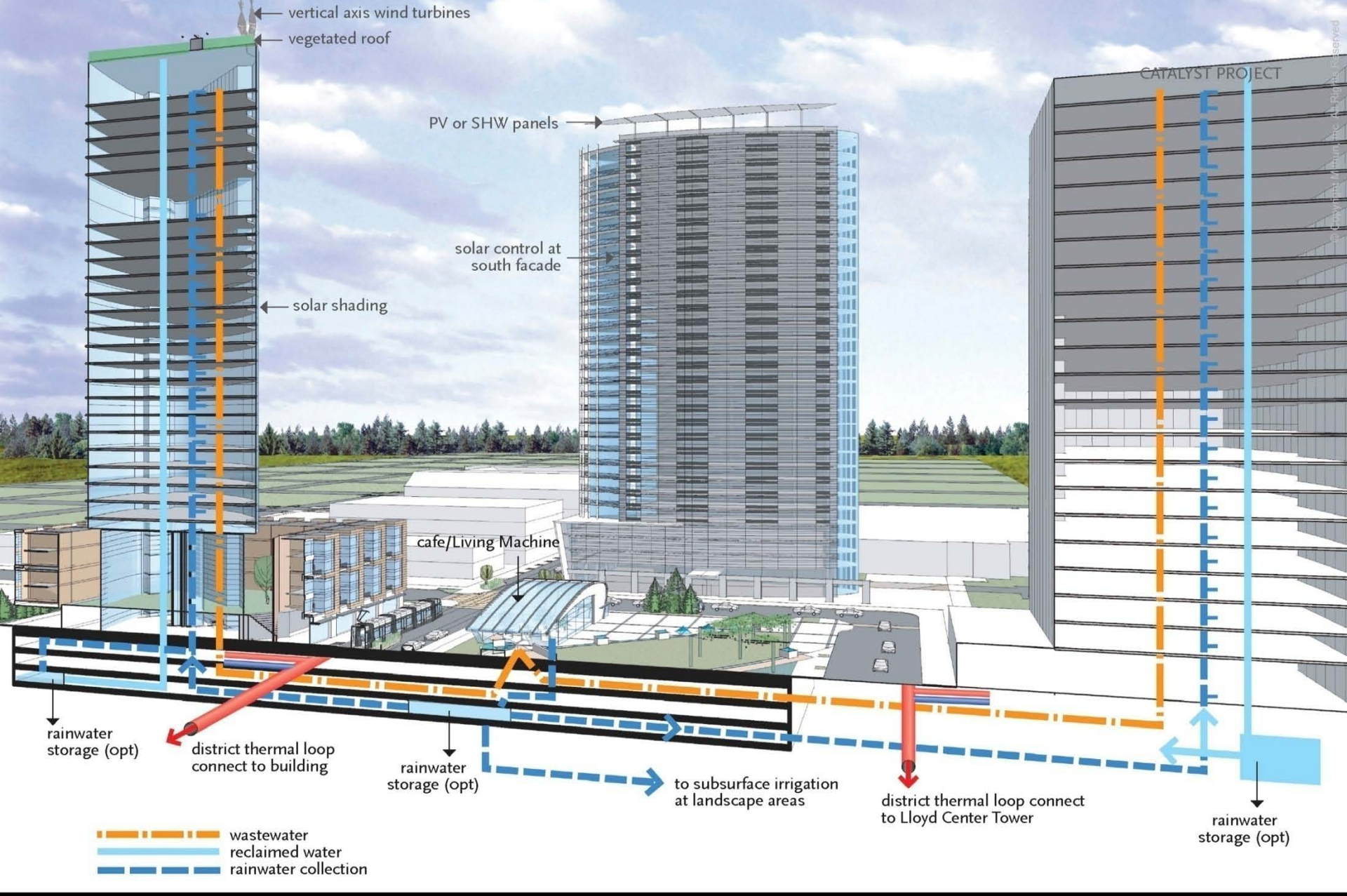
Precipitation
64,000,000

	A	B	C	D	E	F
Water	$451,482	$316,038	$189,623	$189,623	$170,749	
Sanitary	$1,000,806	$704,764	$422,858	$139,689		
Stormwater	$114,956	$114,956	$44,839	$29,810		
		28%	58%	77%	89%	100% Savings
Annual Water Related Utility Cost	Total $1,573,244	Total $1,135,757	Total $657,320	Total $359,121	Total $170,749	Total $0

2004 Data

Municipal Water Use
Strategy / Potable Water Demand

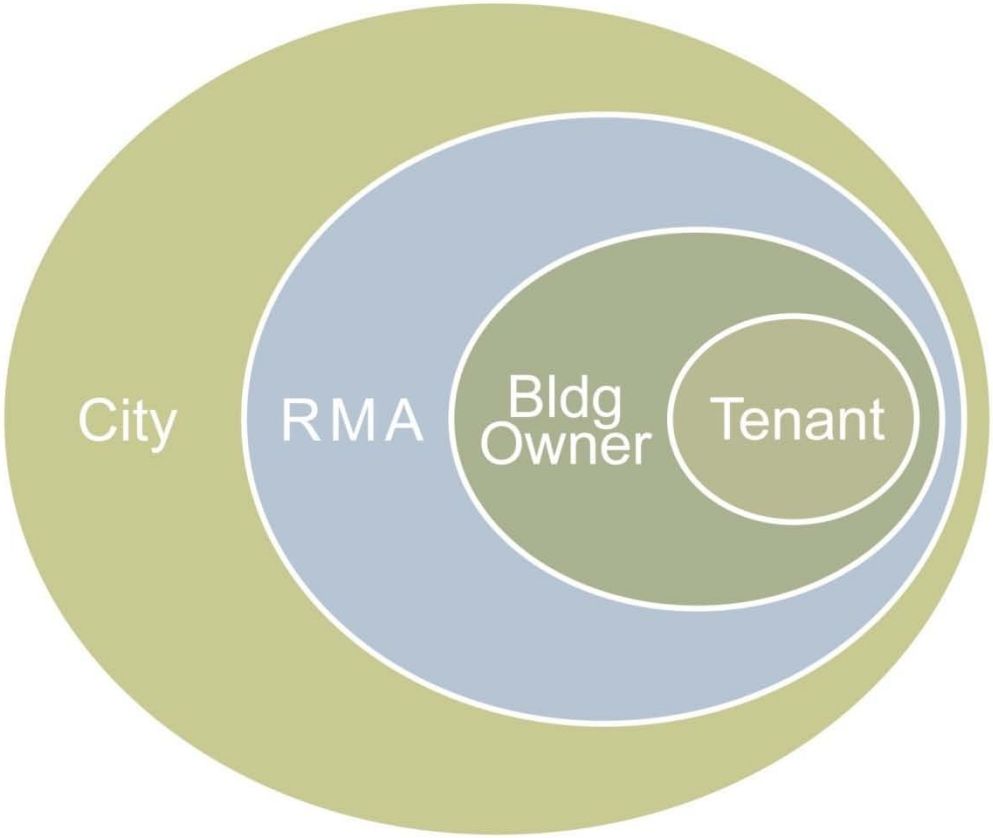
MITHŪN



Lloyd Crossing Sustainable Urban Design Plan

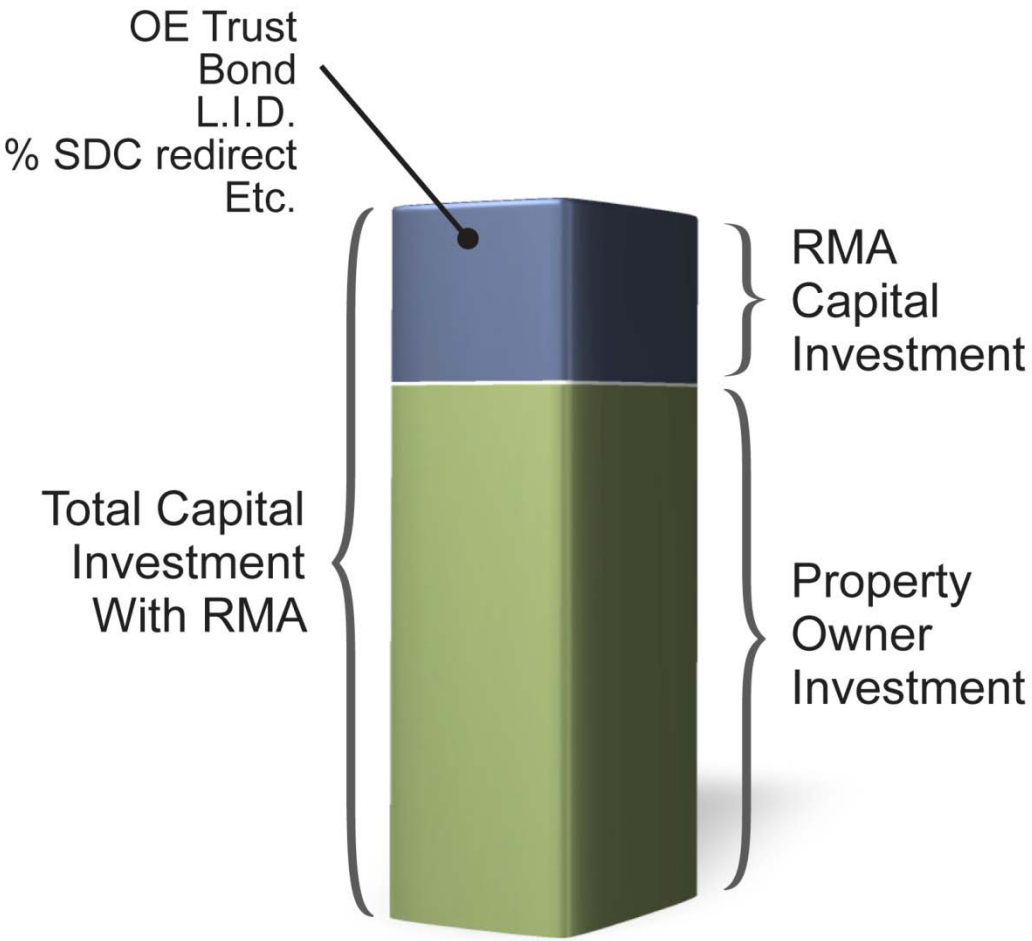
Portland, OR

MITHŪN



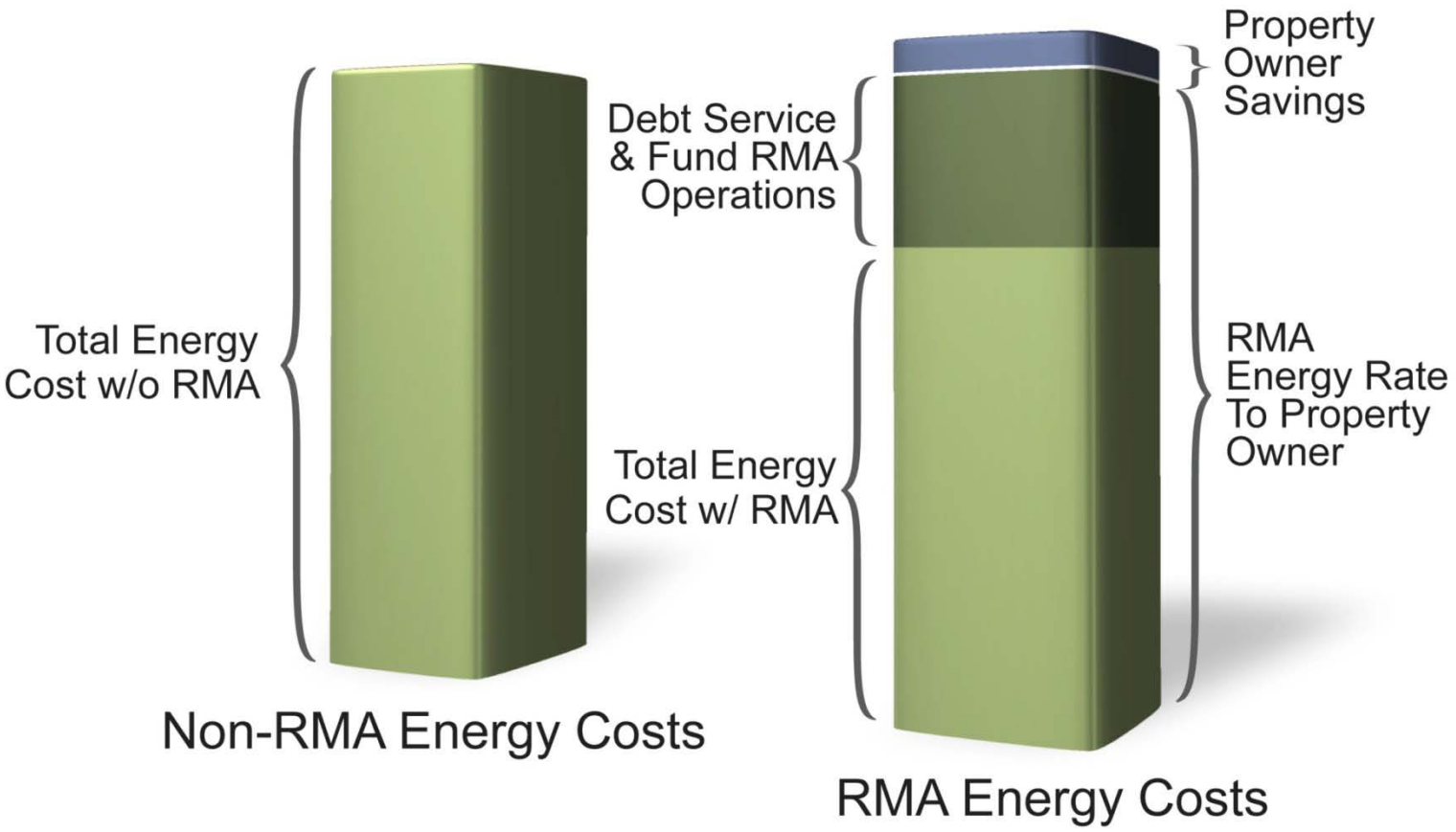
Implementation Responsibility

Resource Management Association (RMA)



Source of Capital

Resource Management Association (RMA)

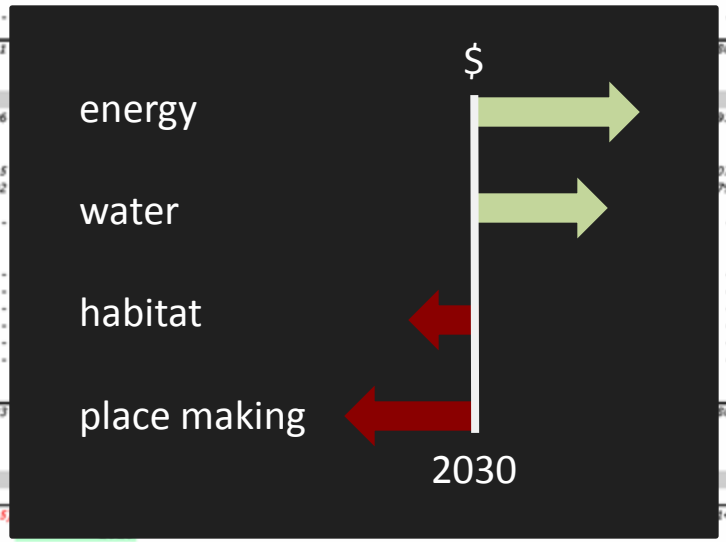


Operating Model

Resource Management Association (RMA)

OVERALL SUMMARY

Uses:		Total	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER												
Building Improvements		$ 9,480,491	$ 2,100,499	$ 1,572,498	$ 829,374	$ 832,534	$ 835,693	$ 838,853	$ 842,012	$ 845,172	$ 848,331	$ 36,31
District Improvements		$ 8,336,249	$ 1,717,635	$ 37,635	$ 4,851,647	$ 247,047	$ 247,047	$ 247,047	$ 247,047	$ 247,047	$ 247,047	$ 247,04
		$ 17,816,741										
ENERGY (inflated @ 2%)		$ 316,047,076	$ 4,071,532	$ 19,047,715	$ 24,240,090	$ 24,032,884	$ 28,045,143	$ 33,542,736	$ 38,171,772	$ 43,235,087	$ 48,298,402	$ 53,361,71
HABITAT / OPEN SPACE		$ 32,125,750	$ 5,880,600	$ 5,472,225	$ 12,419,450	$ 1,406,250	$ 6,947,225	$ -	$ -	$ -	$ -	$ -
PLACEMAKING		$ 14,653,750	$ 14,653,750	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Uses:		$ 380,643,317	$ 28,424,016	$ 26,130,073	$ 42,340,561							$ 53,645,08
Sources:												
WATER	*Savings Reinvested @ 80%$*	$ 40,212,445	$ 1,202,221	$ 1,709,206	$ 3,497,996							$ 5,641,71
ENERGY												
Offsets	*Inflation @ 2%*	$ 84,739,389	$ 1,339,105	$ 7,115,812	$ 8,030,715							$ 11,771,63
Savings	*Reinvested @ 80%*	$ 260,698,421	$ 634,557	$ 4,129,814	$ 7,729,092							$ 57,112,68
HABITAT / OPEN SPACE		$ -	$ -	$ -	$ -							$ -
OTHER POTENTIAL FUNDING SOURCES												
Urban Renewal Funds		$ -	$ -	$ -	$ -							$ -
Tax Increment Financing		$ -	$ -	$ -	$ -							$ -
Local Improvement District		$ -	$ -	$ -	$ -							$ -
New Market Tax Credits		$ -	$ -	$ -	$ -							$ -
EPA Sustainability Pilot Grant		$ -	$ -	$ -	$ -							$ -
Subtotal - Other		$ -	$ -	$ -	$ -							$ -
Total Sources:		$ 385,650,255	$ 3,175,883	$ 12,954,832	$ 19,257,803							$ 74,526,23
Net Cash Flow:												
WATER	5-Year Cash Flow:	$ 22,395,705	$ (2,615,913)	$ 99,072	$ (2,183,025)							$ 5,358,35
	Payback Year:			2010								
ENERGY	5-Year Cash Flow:	$ 29,390,733	$ (2,097,870)	$ (7,802,088)	$ (8,480,283)	$ (2,529,578)	$ 1,317,927	$ 3,763,210	$ 7,122,731	$ 9,890,000	$ 12,683,885	$ 15,522,80
	Payback Year:						2025					
HABITAT / OPEN SPACE	5-Year Cash Flow:	$ (32,125,750)	$ (5,880,600)	$ (5,472,225)	$ (12,419,450)	$ (1,406,250)	$ (6,947,225)	$ -	$ -	$ -	$ -	$ -
	Payback Year:											
PLACEMAKING	5-Year Cash Flow:	$ (14,653,750)	$ (14,653,750)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Payback Year:											
GRAND TOTAL DISTRICT CASH FLOW:		$ 5,006,938	$ (25,248,134)	$ (13,175,241)	$ (23,082,758)	$ (1,177,484)	$ (2,533,190)	$ 7,198,078	$ 10,897,353	$ 14,005,370	$ 17,140,999	$ 20,881,152
Payback Year:								2030				



2004 Data

Lloyd Resource Management Association
Financial Model

MITHUN

Lloyd Crossing Sustainable Urban Design Plan

Portland, Oregon

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MITHŪN

Project Green

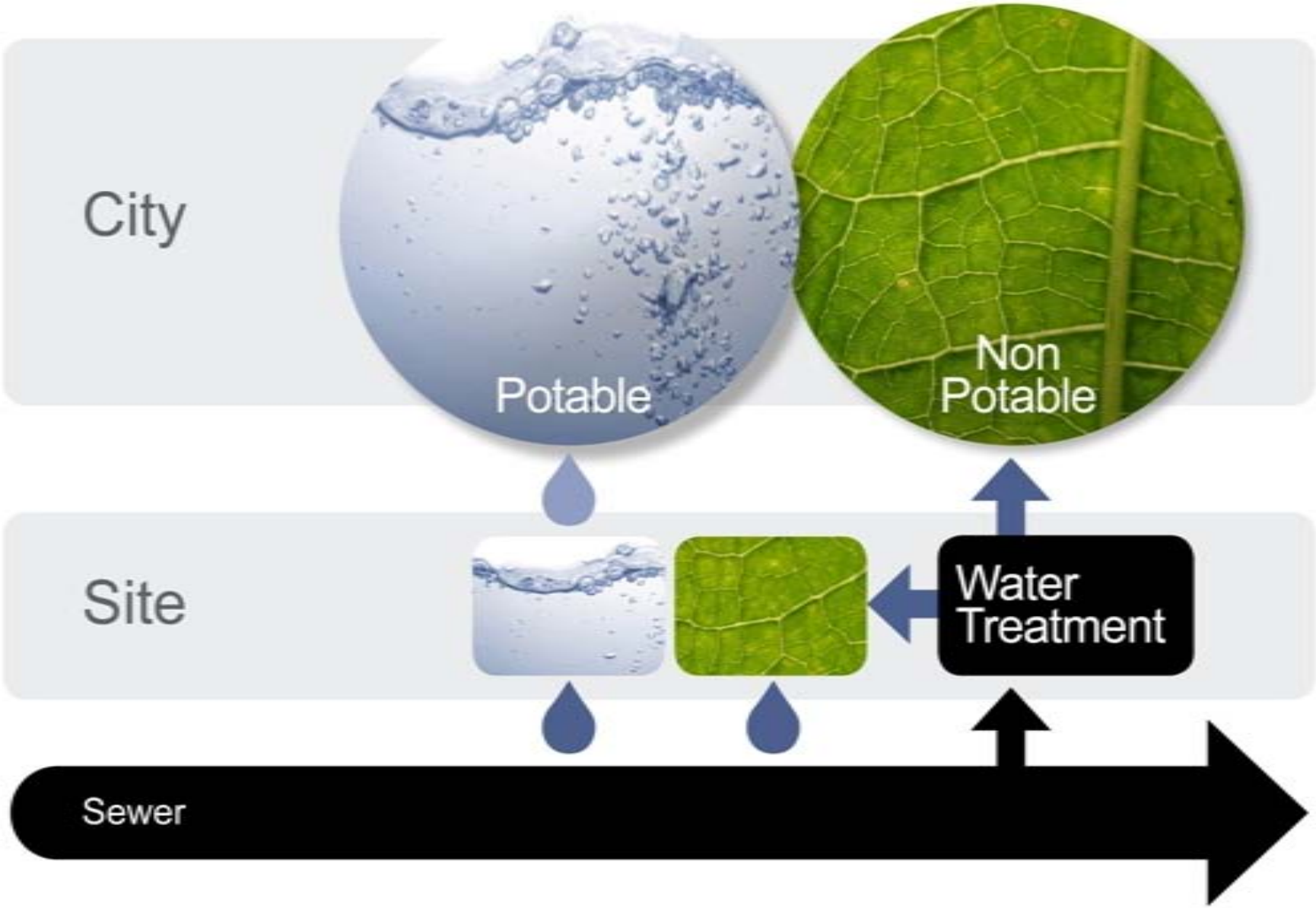
Austin, Texas

MITHŪN

Project Green

Austin, Texas

MITHŪN



Water Neutral Development Concept

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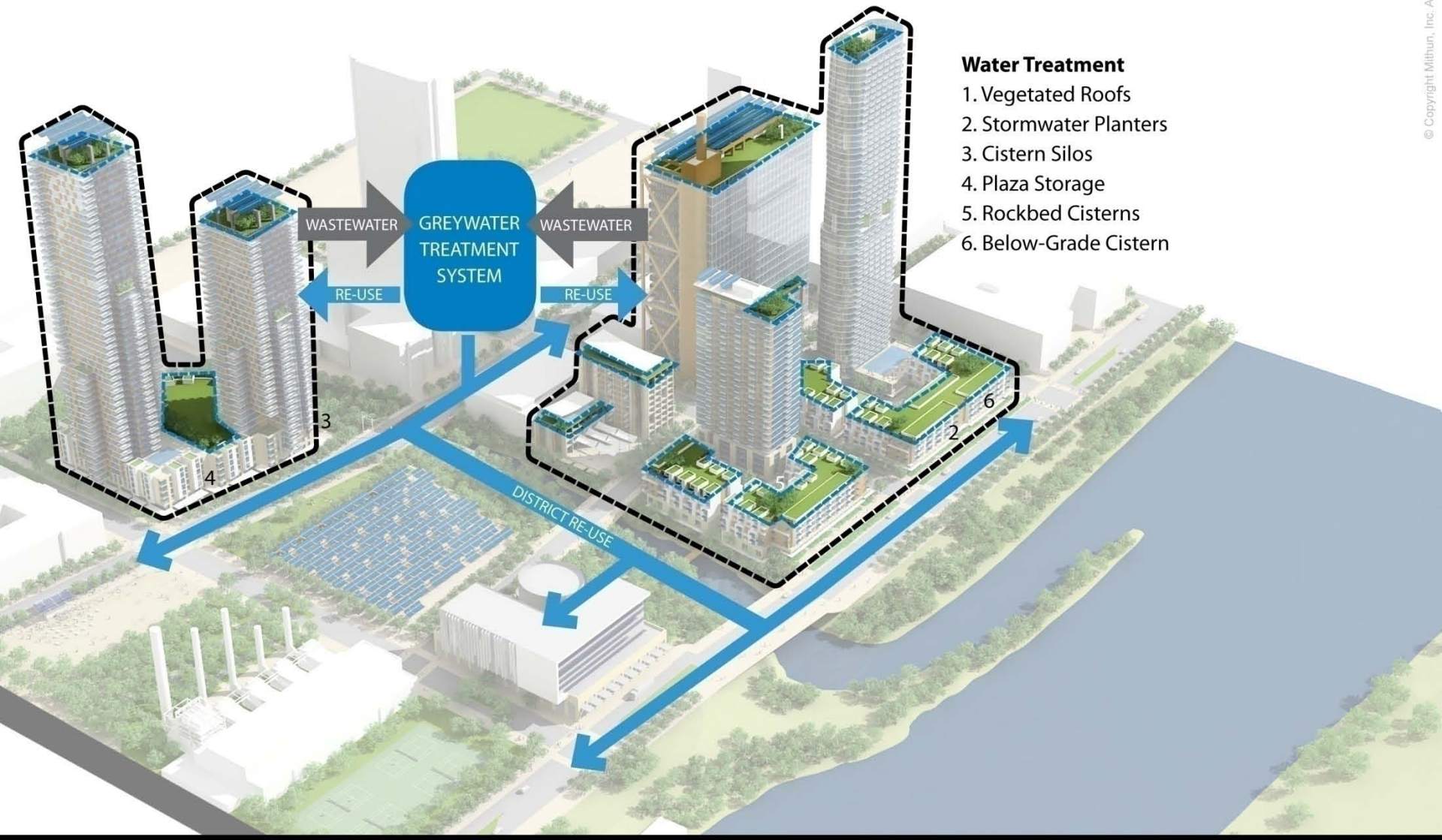

Project Green - Water Treatment

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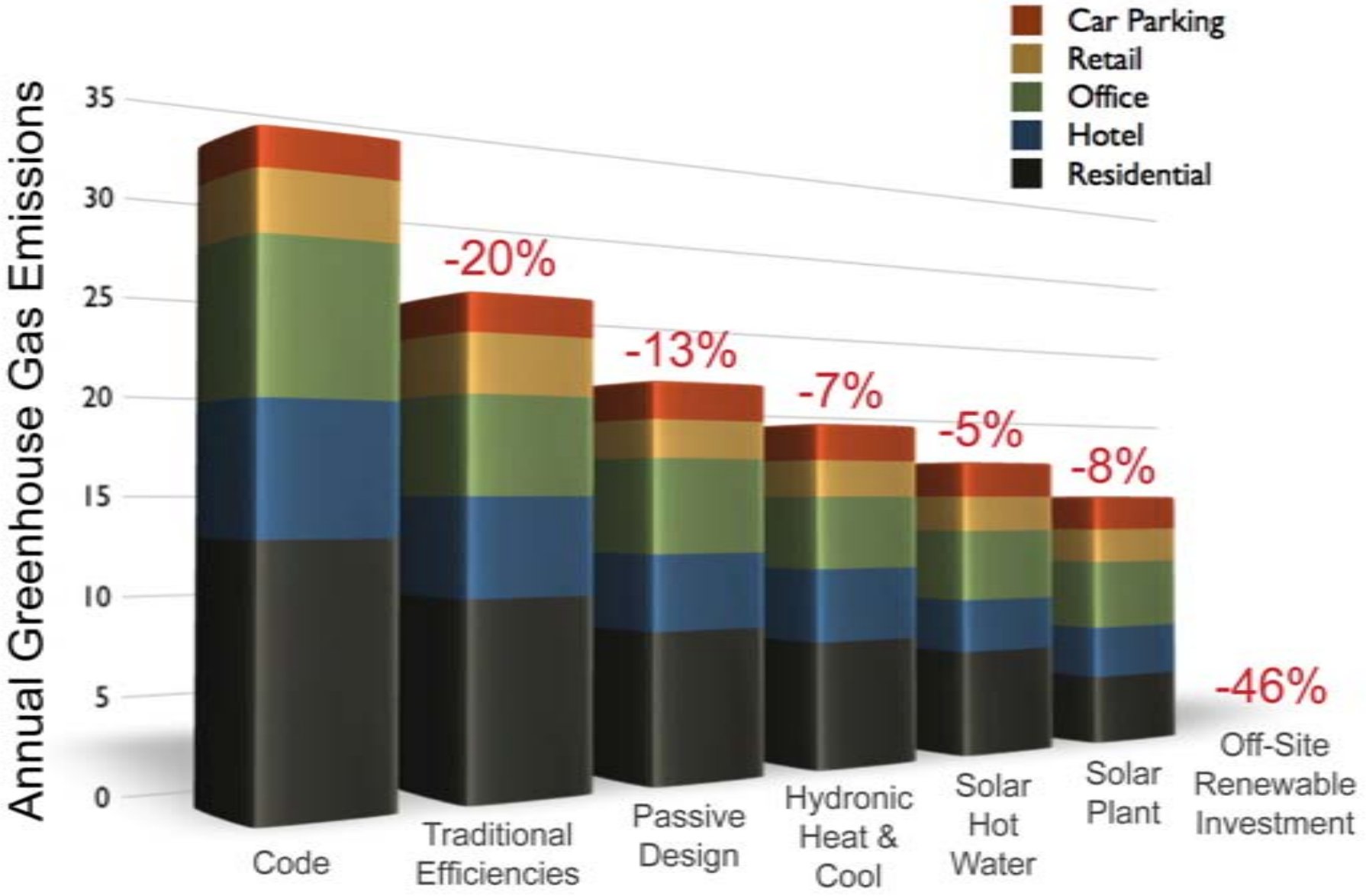

Carbon Neutral Development Concept

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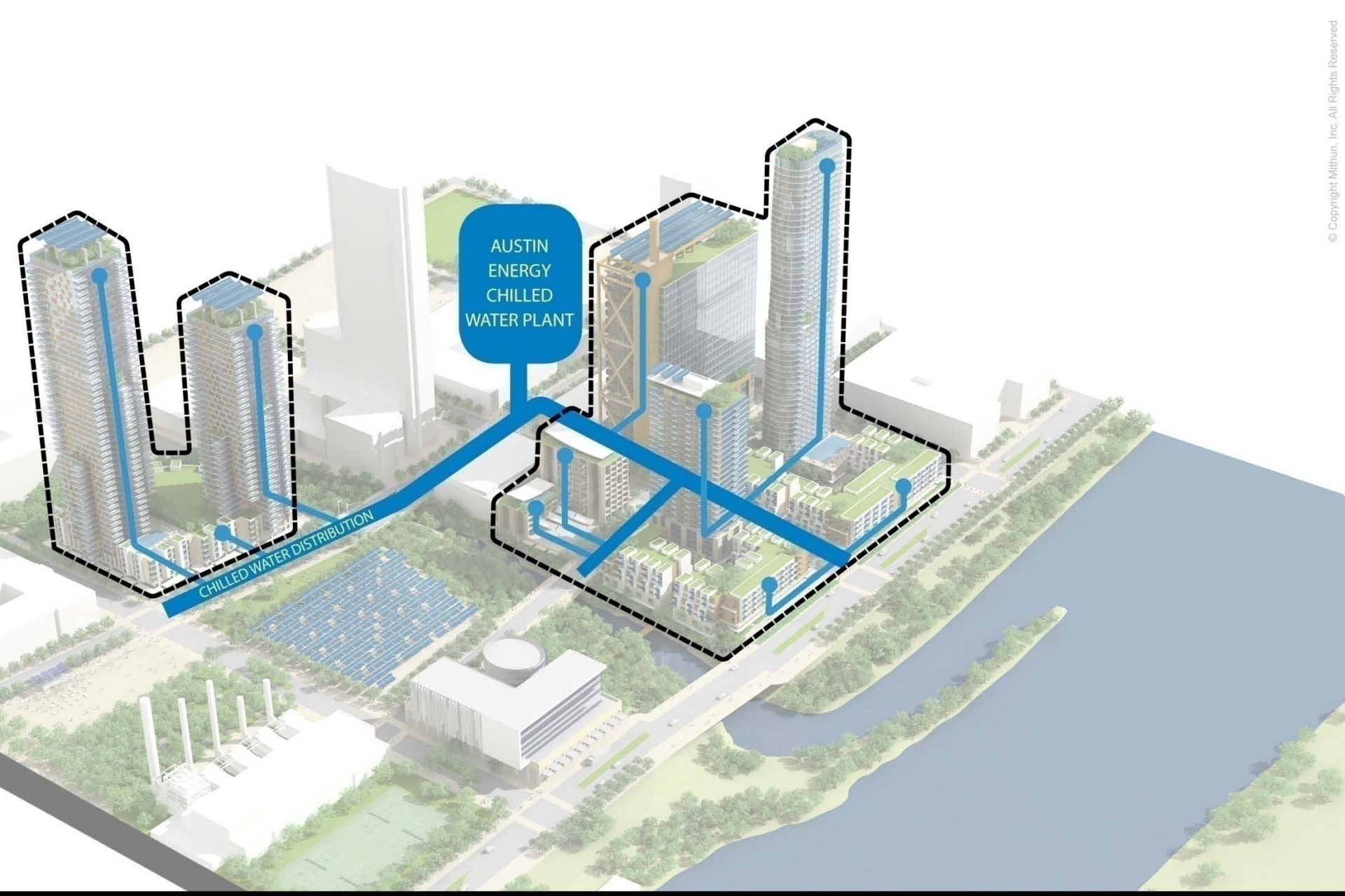
Passive Building Design

7. Solar screens on South and West Facades
8. PV Panels on Canopies
9. Double Skin Membrane
10. Shaded Balconies

Project Green - Passive Building Design



Project Green - Chilled Water Distribution

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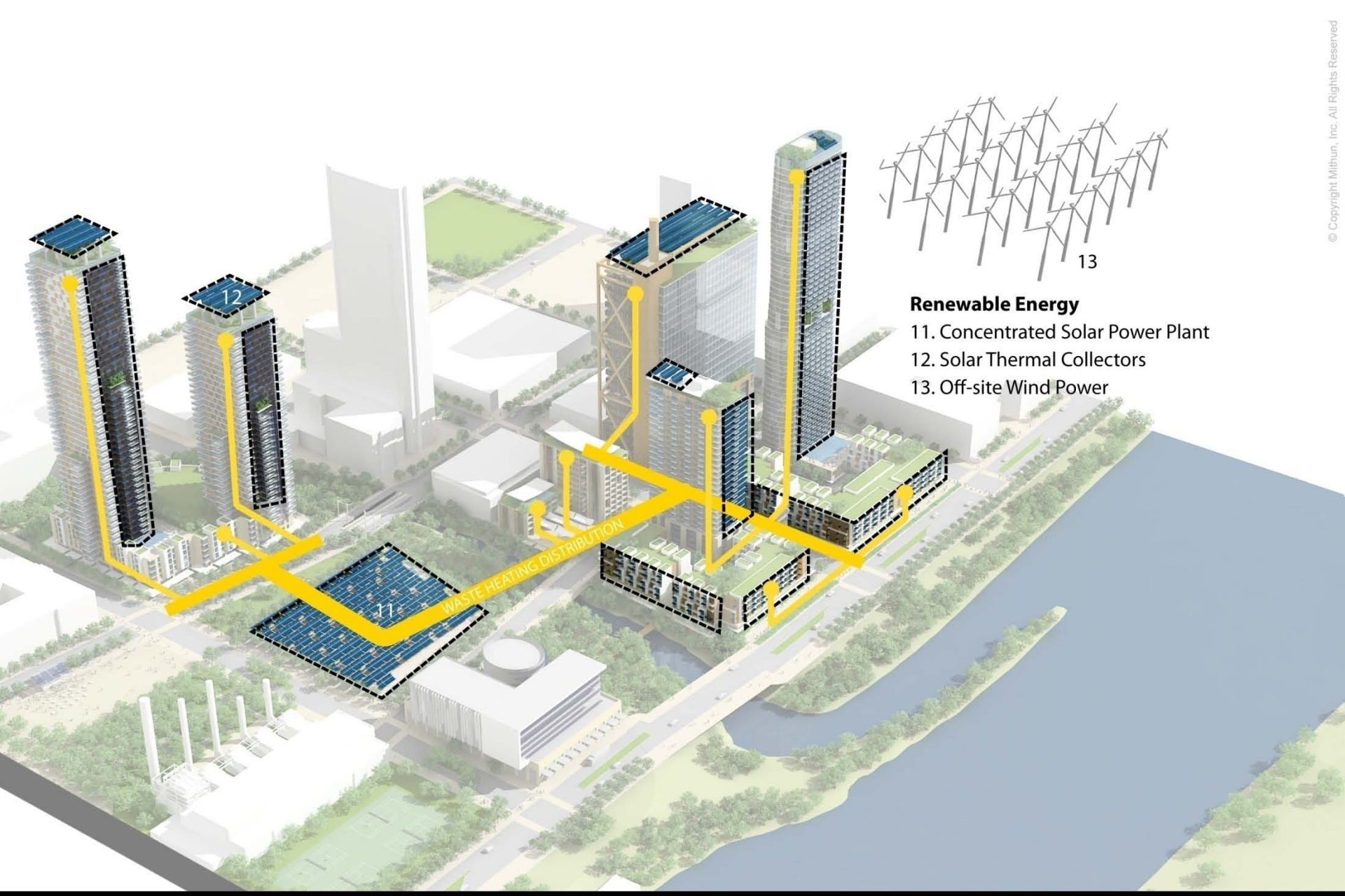

Project Green - Renewable Energy

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Project Green

Austin, TX

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Climate Benefit District

Climate Benefit District

GHG Reduction Strategies

MITHŪN

Climate Benefit District

GHG Reduction Strategies

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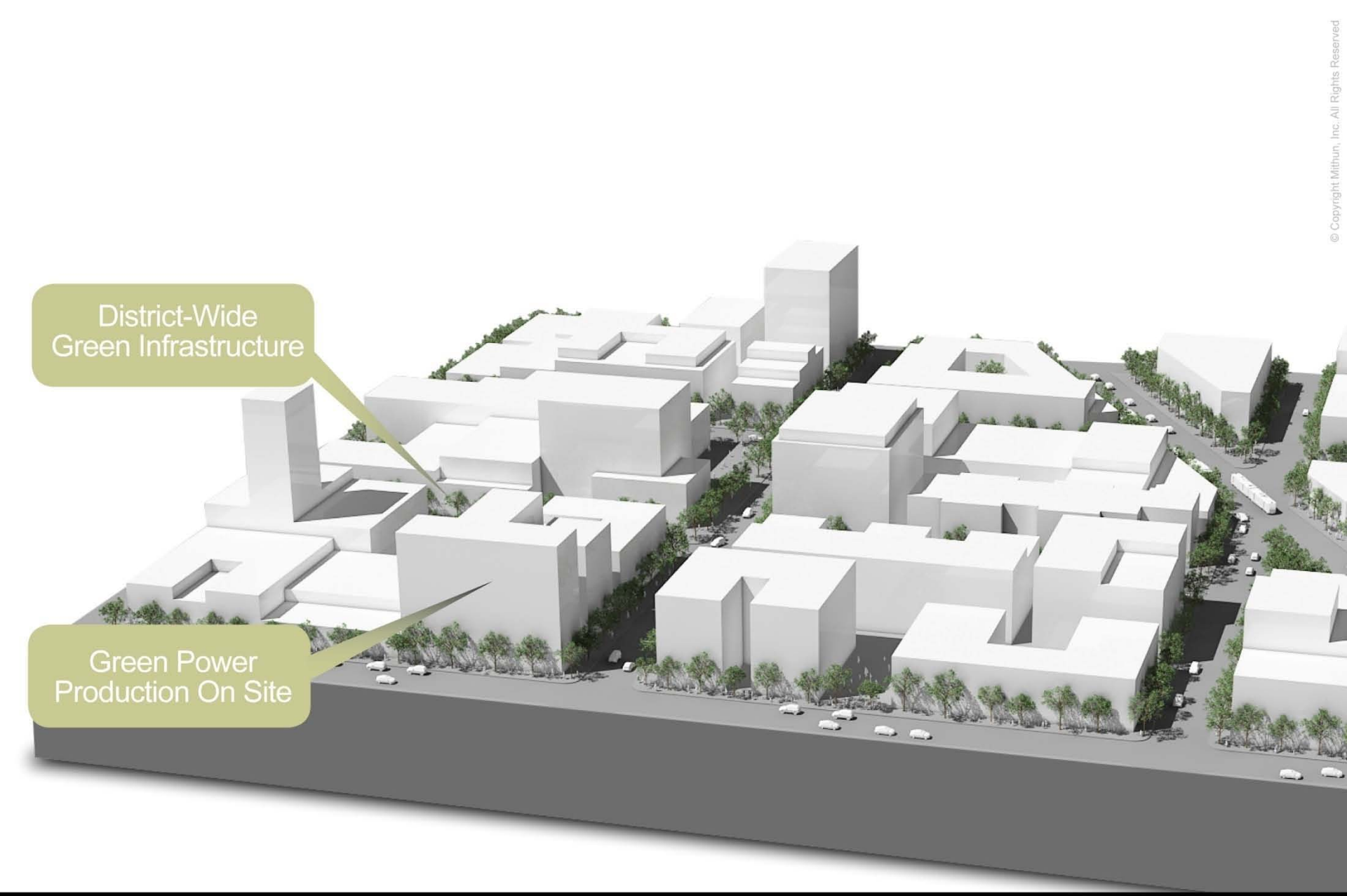

Climate Benefit District

GHG Reduction Strategies

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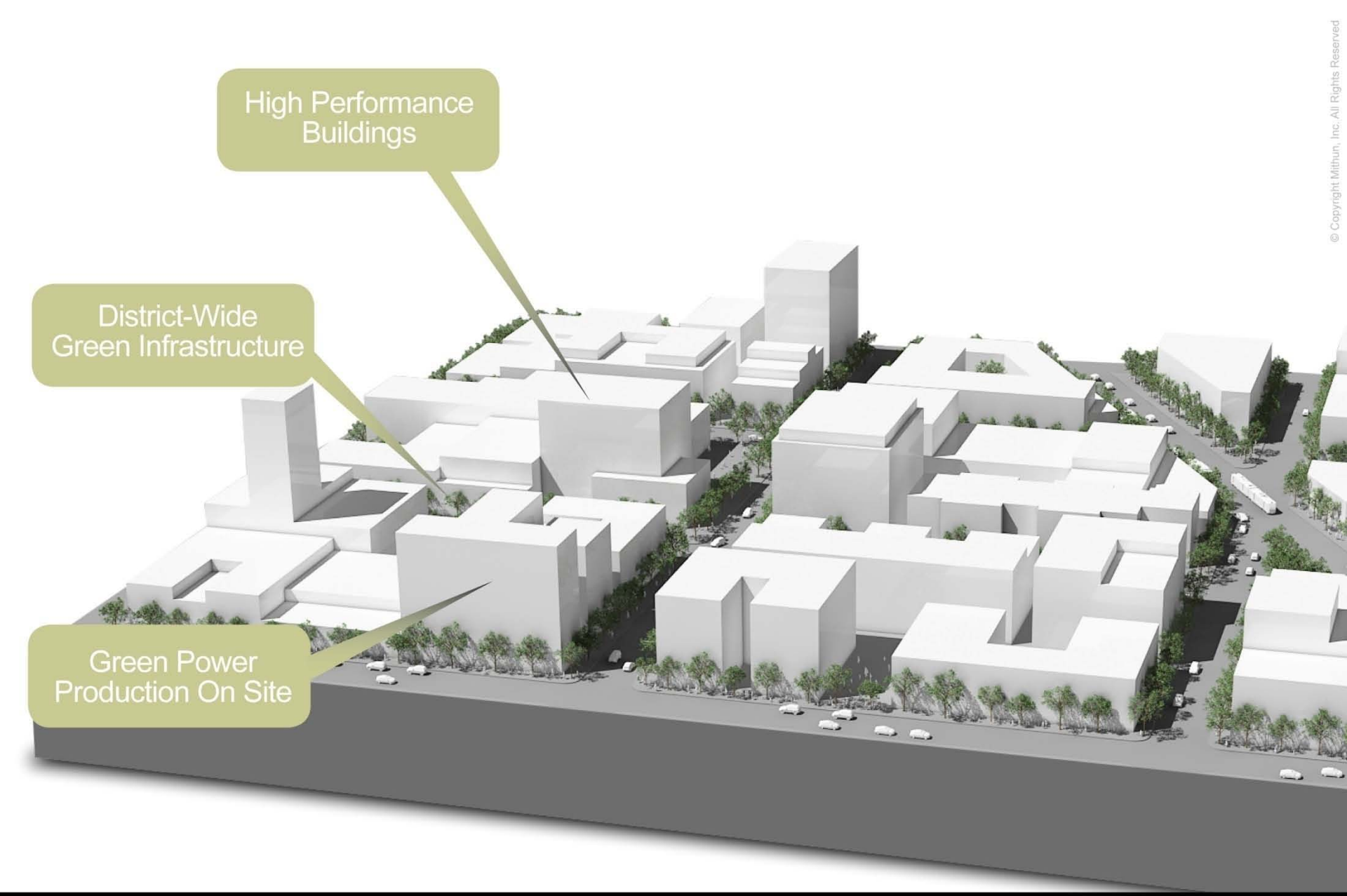

Climate Benefit District

GHG Reduction Strategies

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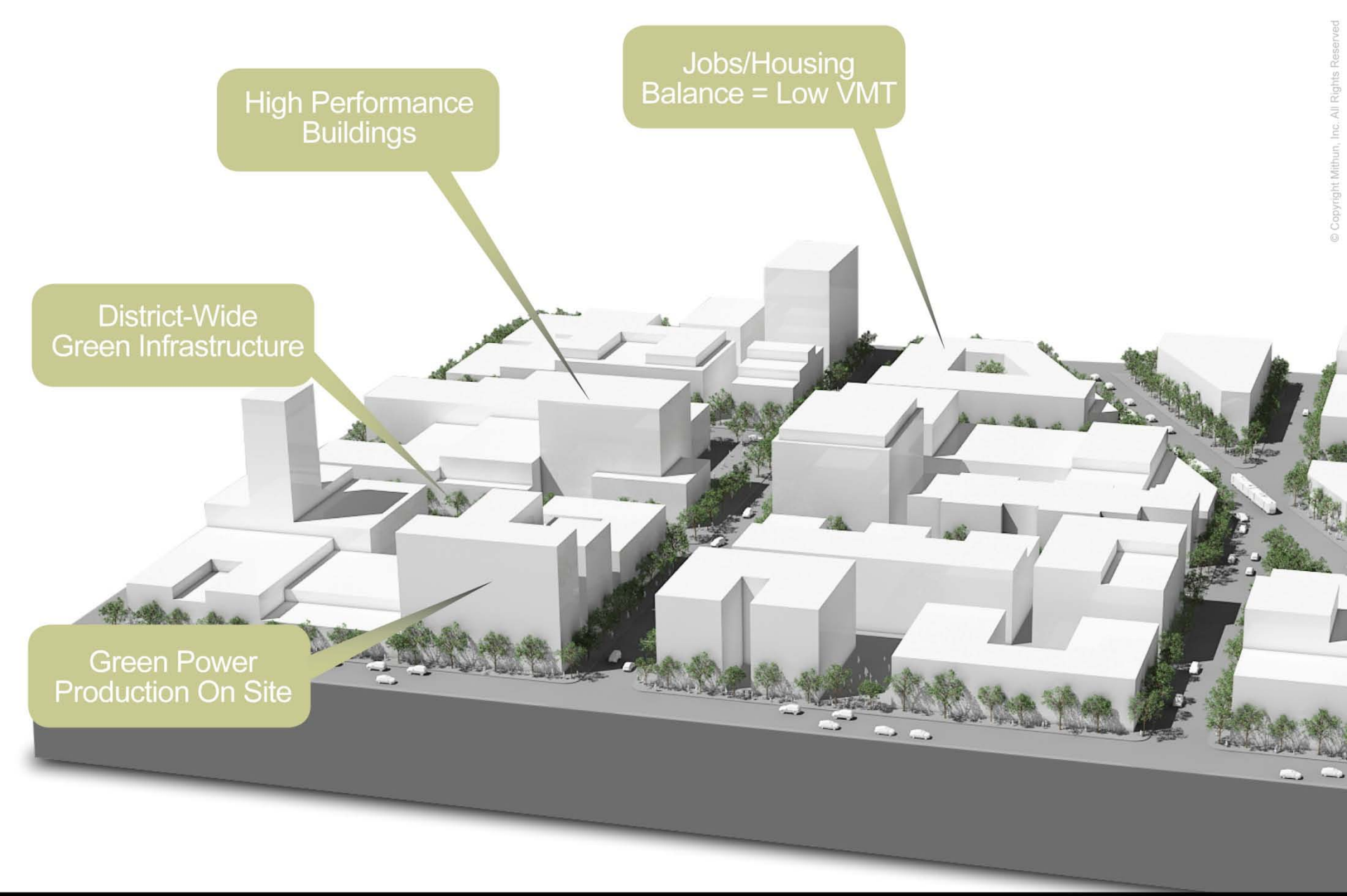

Climate Benefit District

GHG Reduction Strategies

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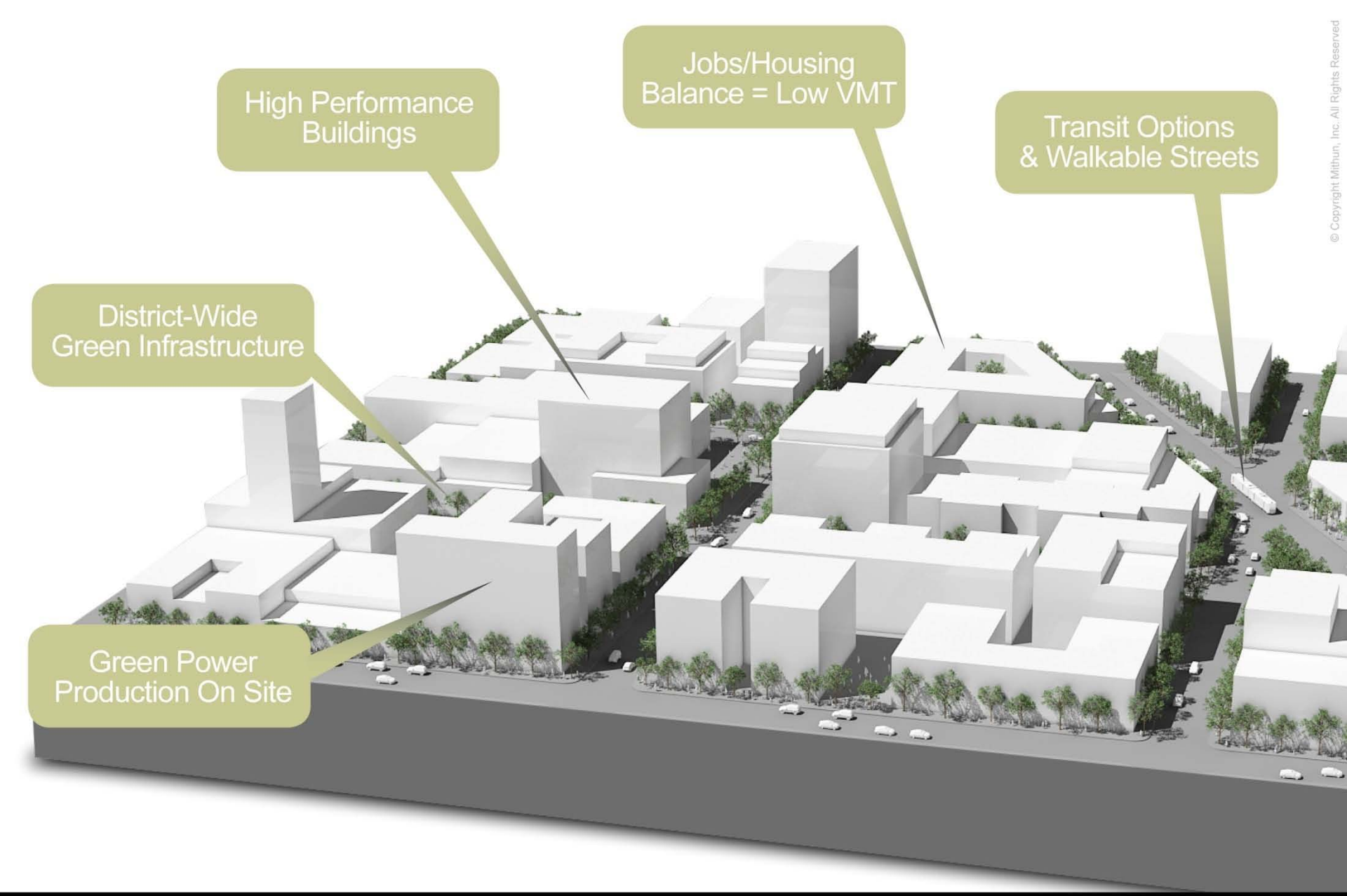

Climate Benefit District

GHG Reduction Strategies

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Step 4: CBD Created

Neighborhood Sustainability Plan

- Integrated infrastructure & utilities
- VMT reduction strategies
- Green building & land use initiatives
- Social sustainability plan
- Finance & governance

Step 3: Recommend to City Council

Community Sustainability Agency

Citywide Sustainability Plan

Step 2: Develop NSPs

City Council

Step 1: Designate CSA

Climate Benefit District

Voluntary Formation Process

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Base photo by Hamuchen via Flickr

Climate Benefit District

GHG Reduction Strategies

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Bert Gregory FAIA Lloyd Green District March 3, 2009