

Sustainability 2030 Institute + Green Urban Design

Regenerative Urbanism

Platform for Next Generation Practice

Inventing the Platform and Path to Sustainability Success

Scott Edmondson, AICP, ISSP-SA

Principal, Sustainability 2030 Institute

Charles Kelley AIA LEED AP B+C

Principal, Green Urban Design

*Session 0670 Healthy Cities, Abstract 447, February 23, 2022, 7:00am to 8:30am PST
EcoCity World Summit 2022, online, 22-24 February -- Urban Transformations for Nature-Based Solutions and Biodiverse, Circular, Healthy, and Resilient Cities*

Creative Commons License, 2021, CC BY NC SA

CONTENTS



Nikken Sekkei

- **Current predicament:** urgency
- **New Approach:** regenerative systems sustainability
- **Applications:** work at the sustainable scale of the built environment—the urban district
- **Summary:** smart governance to catalyze a regenerative economy from a regenerative built environment

Predicament

*Current approach may not produce sustainability, **at least in time***

LIFE SUPPORT SYSTEM INSECURITY

August 29th, 2021
Earth Overshoot Day

- **IPCC (2018)** : only ten years left to critical climate milestones.
- **KPMG Study (2021)**: societal collapse by 2040 not 2060.
- **An accelerating sixth mass extinction**
- **UN IPBES Global Assessment (2019)**: unprecedented declining nature

WHY?

Portland in the 1960's

- Air pollution
- Contaminated river
- Car focused, large surface parking
- Not connected, not people-centric

- **Mistakenly see the problem as environmental**
- **Treat symptoms not source**
- **Use a static approach**
- **When reality is a dynamic system of systems**

RESULT?



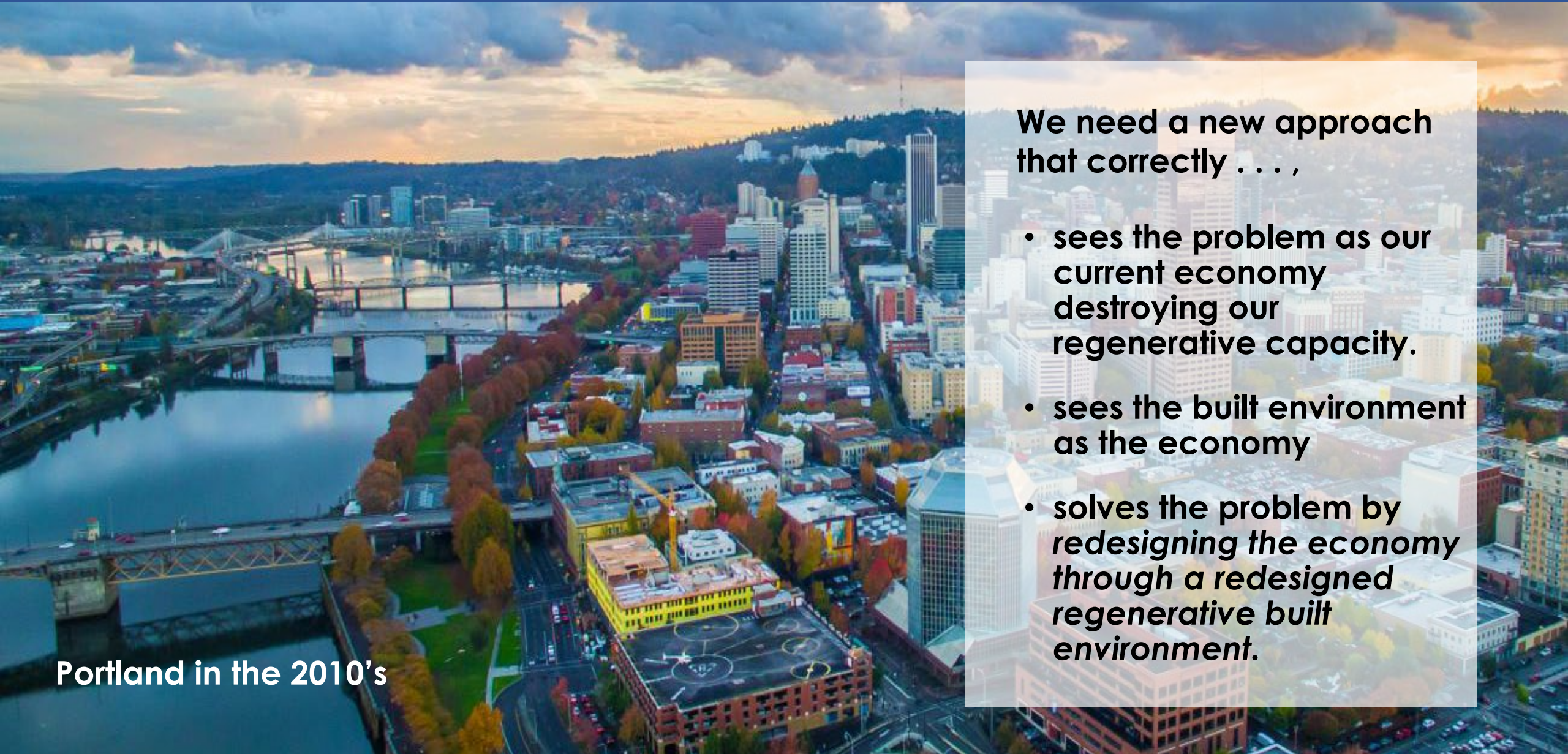
BEFORE



AFTER

- We mis-specify sustainability and go in the wrong direction or too slowly.
- Making sustainable components instead of making sustainable systems.

LIFE SUPPORT SYSTEM SECURITY: SUSTAINABLE SCALE OF THE ECONOMY



Portland in the 2010's

We need a new approach that correctly . . . ,

- sees the problem as our current economy destroying our regenerative capacity.
- sees the built environment as the economy
- solves the problem by *redesigning the economy through a redesigned regenerative built environment.*

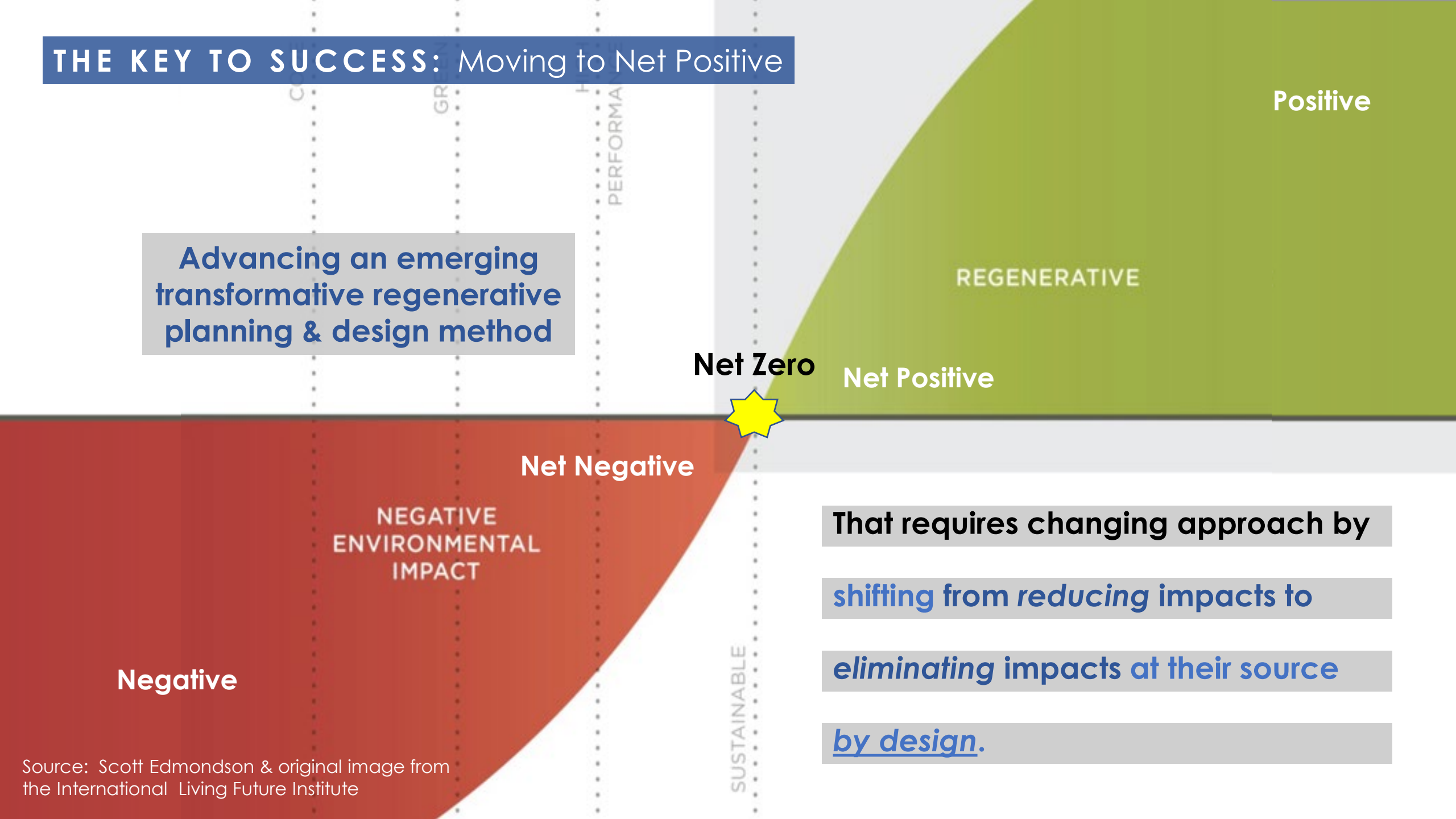
New Approach

Regenerative Urban Economy

- **Sustain desired human and natural outcomes.**
- creating regenerative built environments that **create regenerative local economies.**

THE KEY TO SUCCESS: Moving to Net Positive

Advancing an emerging transformative regenerative planning & design method

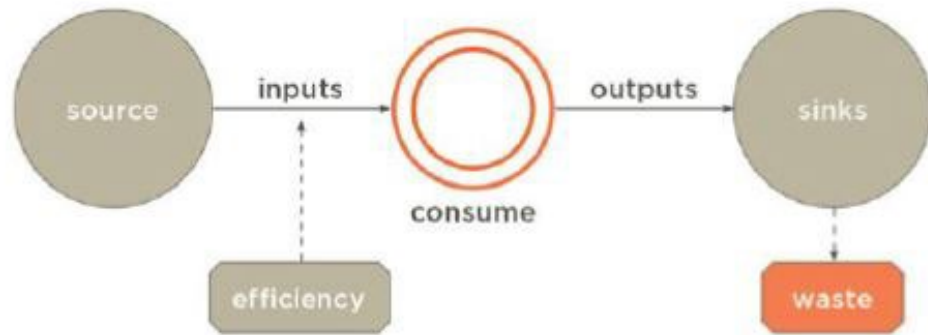


That requires changing approach by shifting from *reducing* impacts to *eliminating* impacts at their source by design.

Source: Scott Edmondson & original image from the International Living Future Institute

THE KEY TO SUCCESS: Enhance BOTH Ecological & Human Economic Carrying Capacity by Design

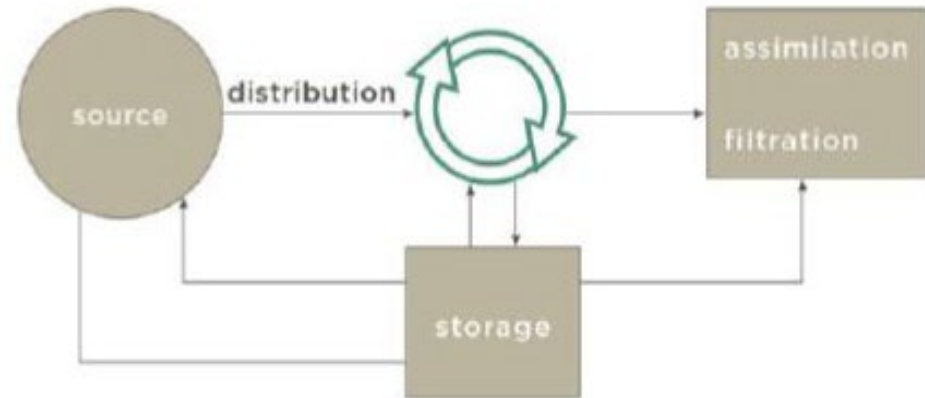
EXISTING THROUGHPUT SYSTEMS



- Efficiency as end goal
- Degenerative linear flows

By transforming linear flows in the human system that produce waste & use up finite resources **by design**

REGENERATIVE SYSTEMS



- Effectiveness as end goal
- Within renewal capacity
- Integrate with natural processes
- Symbiosis
- Closed-loop system
- Multiple pathways

into Circular flows that produce NO waste & use infinitely regenerated resources **by design**

IT ARISES FROM

- Redefining our understanding of sustainability around regeneration as the core principle
- Redefining our practice to produce real regenerative built environment



SHIFTS THE FOCUS FROM SILOS TO SYSTEMS

- From stocks TO processes
- From linear TO circular material flows
- From non-renewable TO renewable energy
- From subsystem TO whole system optimization
- From content TO context
- From problem symptoms TO sources
- From impact reduction TO avoidance by design
- From net negative TO net positive impact
- From static parts TO dynamic systems
- From the environment TO the economy
- **From** buildings TO city-region systems
- From topical goals TO systems imperatives
- **From** problem solving TO future designing

This shift connects the human economy & society to the biosphere's living systems

- *not* with *end-of-pipe* impact mitigation, as we do now,
- *but* at the foundational level of *operating principles*

SHIFTS FROM PLANNING GOALS TO ACHIEVING LIVING SYSTEM IMPERATIVES

Ensure life support system security.

No destruction/only
enhancement of nature
(natural capital)

Full-cost
price decisions

100% renewable
energy economy
(solar+)

Use **Biosystemsmimicry** to
Create a Circular
Economy

100% organic
food production
system

No
pollution

Open
biological
economic
loops

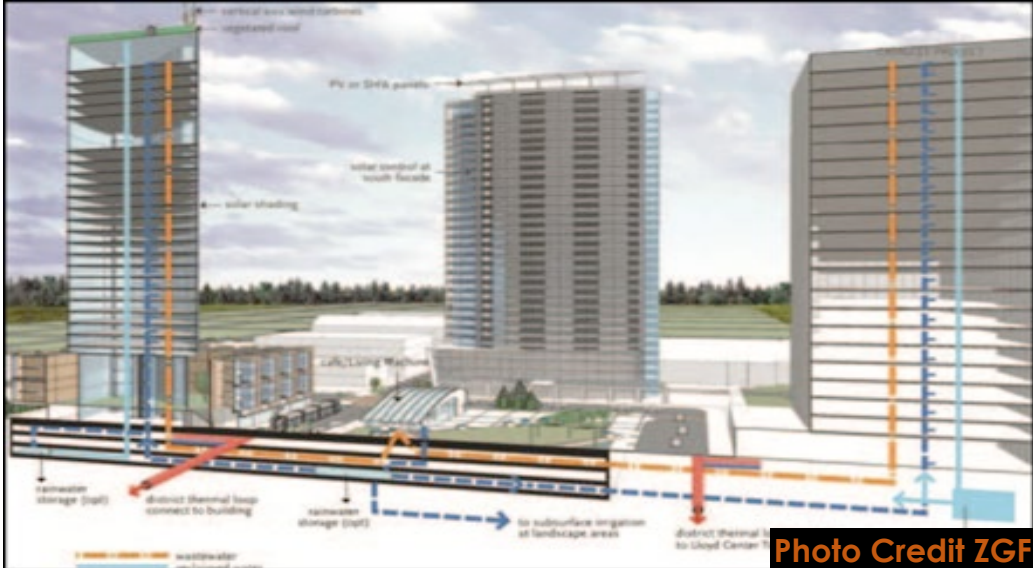
etc.

Closed
technical
economic
loops

100% continuous
materials cycling in
production by design for
deconstruction

0% mining
new
material

CAN SEE INNOVATION BUBBLING UP IN PRACTICE!



- **Planning** | Formulating the policies & rules for **designing/building high-performance settlements** (Eco-Districts, -Cities, -Regions); **Biophilic Pl. & Design** to connect health & land use.
- **Urban Design** | Adding water & habitat (biophilia) to the urban design palette **to create high-performance living places** as part of a **living systems urban metabolism**.
- **Architecture** | Prioritizing energy efficiency **to enable the renewable energy economy**. The 2030 Challenge, NZE+T (buildings + transportation), Passive House building tech. etc.; **and biophilia to create living Buildings/Walls/Roofs**.
- **Landscape Architecture** | Shifting from aesthetics **to habitat creation for biodiversity & human health** (Biophilic Pl. & Design) **in living city-regions**.
- **Utilities** | Shifting from gray to green urban **infrastructure with nature-based solutions and ecosystem-services to create living urban & regional metabolism**.

HAS MOVED FROM THEORY TO THE GLOBAL CITY PRACTICE LAB



REGENERATION

BURNABY, BC. Adopting an Environmental Sustainability Strategy that anchors an integrated, regenerative, and net positive community vision



IT / SMART CITY

KASHIWA-NO-HA, JAPAN. Managing a comprehensive Smart City program that enhances environmental performance and social cohesion



ENERGY

VANCOUVER. Leading a comprehensive Renewable City Strategy committed to 100% renewable supply (including transport) using neighborhood energy utilities



MOBILITY

VIENNA. Providing a coordinated network of emissions-free transit options that eliminate the need for personal automobiles



WATER

BARANGAROO SOUTH DISTRICT, SYDNEY Utilizing an integrated district water system that exports surplus recycled water to surrounding communities



LAND USE + ECOSYSTEM

SINGAPORE. Employing a 'livable density' approach that integrates the built environment within natural systems



MATERIALS + WASTE

AMSTERDAM. Designing a local circular economy to eliminate waste, create jobs, and anchor new district developments



HEALTH + WELLBEING

CHICAGO. Leading a comprehensive wellbeing assessment that embeds health equity into every government agency



FOOD

SUNQIAO DISTRICT, SHANGHAI Integrating large-scale vertical farming systems within the public realm to expand regional foodshed capacities

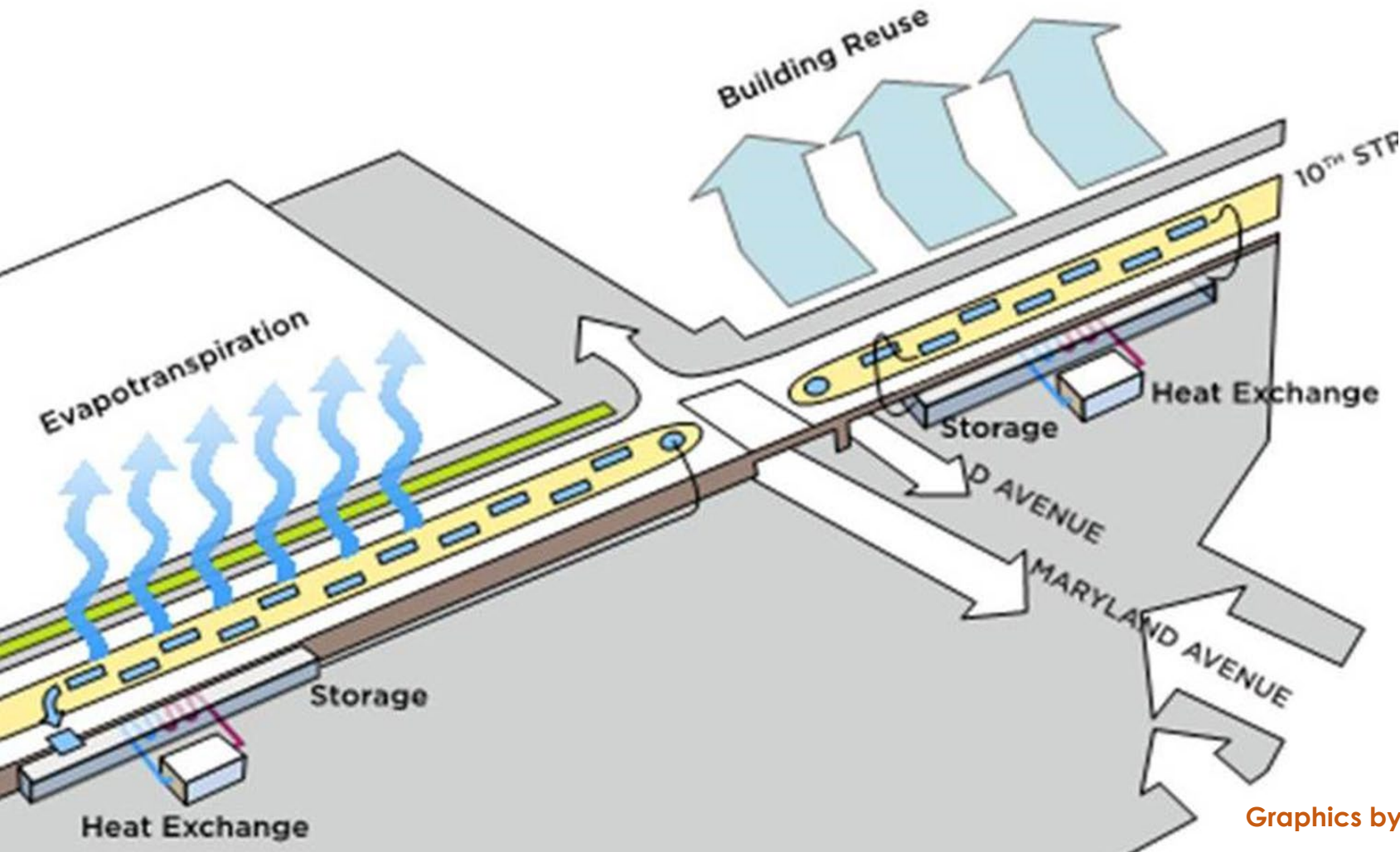


MGMT + GOVERNANCE

COPENHAGEN. Using an innovative public-private model to finance large-scale community regeneration projects

With cities now innovating towards regenerative urbanism around the world with bold programs & projects.

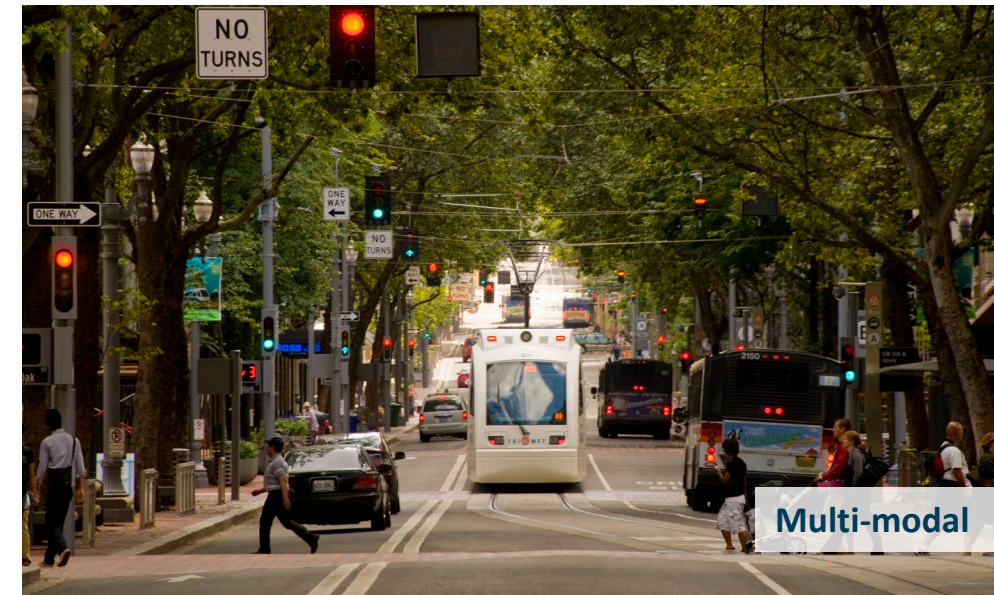
THE TAKEAWAY STRATEGY: use *existing budgets* to reconfigure cities as regenerative life support systems, instead of degenerative.



- by **integrating the performance imperatives of regenerative life support systems**
- **into the city metabolism & economy**
- **Through reconfiguring the built environment and infrastructure**
- **with regenerative systems.**

CREATES A GAME-CHANGING VALUE PROPOSITION

When we realize that the **built environment is the built economy**, our plan/design/build practices become society's lead agents of sustainability success.



As a result, we can **now design a win/win future of jobs AND the environment** (for the first time in history!)

CREATES A NEW DESIGN BRIEF



Design regenerative economy from a regenerative built environment

- To defend against an increasingly hostile nature from accelerating climate change
- By hardening the built environment, economy, & society.
- With a method that mimics the benign and productive regenerative processes of pre-climate change living systems.
- So we can create a governance structure to:
 - Create real resilience.
 - Manage water storage & reuse effectively.
 - Ensure social mobility during climate disruptions.
 - Create economic abundance and inclusive prosperity.

Improvement

Pivot to Sustainable Scale of the Built Economy – the District

*Design at the **district scale** to regenerate resources in nature and in human capacity.*

Urban Biosystemsmimicry

Forming urban district places that coexist with and regenerate nature:

Goal

Natural Systems
Culturally Relevant
Social Mobility
Resource Regenerative

Action

Water Management
Community Informed
Wealth Creation
Cooperation

Outcome

Restoration
Neighborhood
Community
Governance

SUSTAINABLE SCALE OF THE ECONOMY: Kashiwa-no-ha, Innovation Campus Smart City Neighborhood, Chiba Prefecture



**Kashiwa-no-ha
largest Smart City
Project LEED ND Plan
Platinum Certified.**

(2 Jobs / Resident)

365,000 M2

USES:

**25% Residential
13% Research
50% Commercial
& Retail
12% Community
Services**

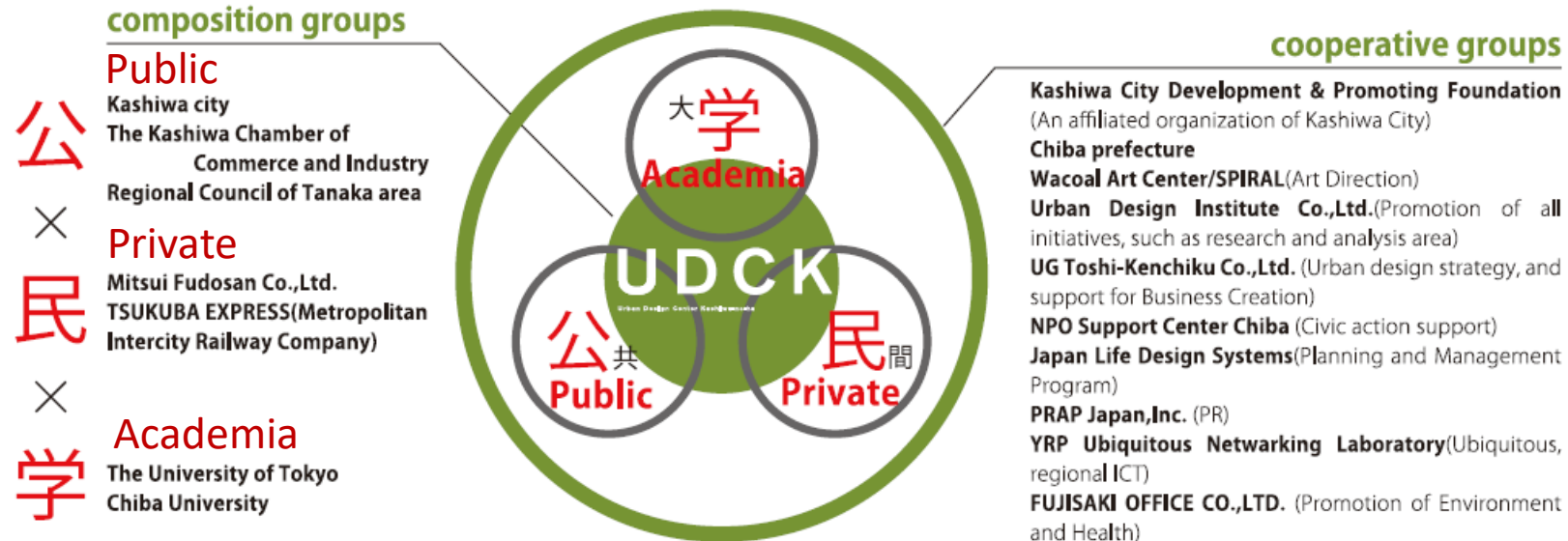
Neighborhood
Restoration
Community
Governance

Linked outdoor spaces, Community Programs/ ICT
Green Infrastructure: Retain 95 percentile Storm Event
Resilience: Mixed Use with jobs to housing ratio, 2:1
**UDCK with LEED ND Plan Platinum Certified with Building and Site
Performance Guidelines**

NEIGHBORHOOD COMMUNITY GOVERNANCE: Urban Design Center Kashiwa-no-ha (UDCK) Since 2006

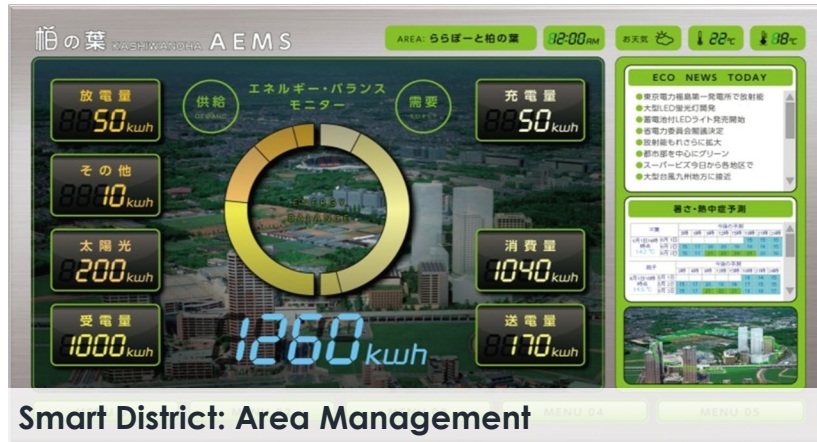


**Hub for Collaboration
with Public-Private-
Academia Partnership**



“CONNECTED” COMMUNITY ENGAGEMENT & “PLACE” STEWARDSHIP

Smart City Technology and Community



LEED v4 for ND Plan Project Checklist

Kashiwa-no-ha 5/10/2016

Yes	No	Req	Points
Y		req 1	5
Y		req 2	5
Y		req 3	5
Y		req 4	5
Y		req 5	5
Y		req 6	5
Y		req 7	5
Y		req 8	5
Y		req 9	5
Y		req 10	5
Y		req 11	5
Y		req 12	5
Y		req 13	5

85 POINTS

LEED ND Plan Certification

1. Continuously tracking and engaging with the community to make a better place.
2. Adapting societal change and community interests.
3. Iterating with community advice.



Nikken Sekkei



Nikken Sekkei



Nikken Sekkei

SUSTAINABLE SCALE OF THE SPATIAL ECONOMY: Central SOMA Regenerative District



BICYCLING
自行车



OPEN AIR
STREET CAFES



SAFE STREETS
FOR CHILDREN



WALKABILITY



STRONG
RETAIL BASE



STORMWATER
MANAGEMENT



PUBLIC TRANSIT



(5 Jobs / Resident)
SIZE: 3,000,000 SM

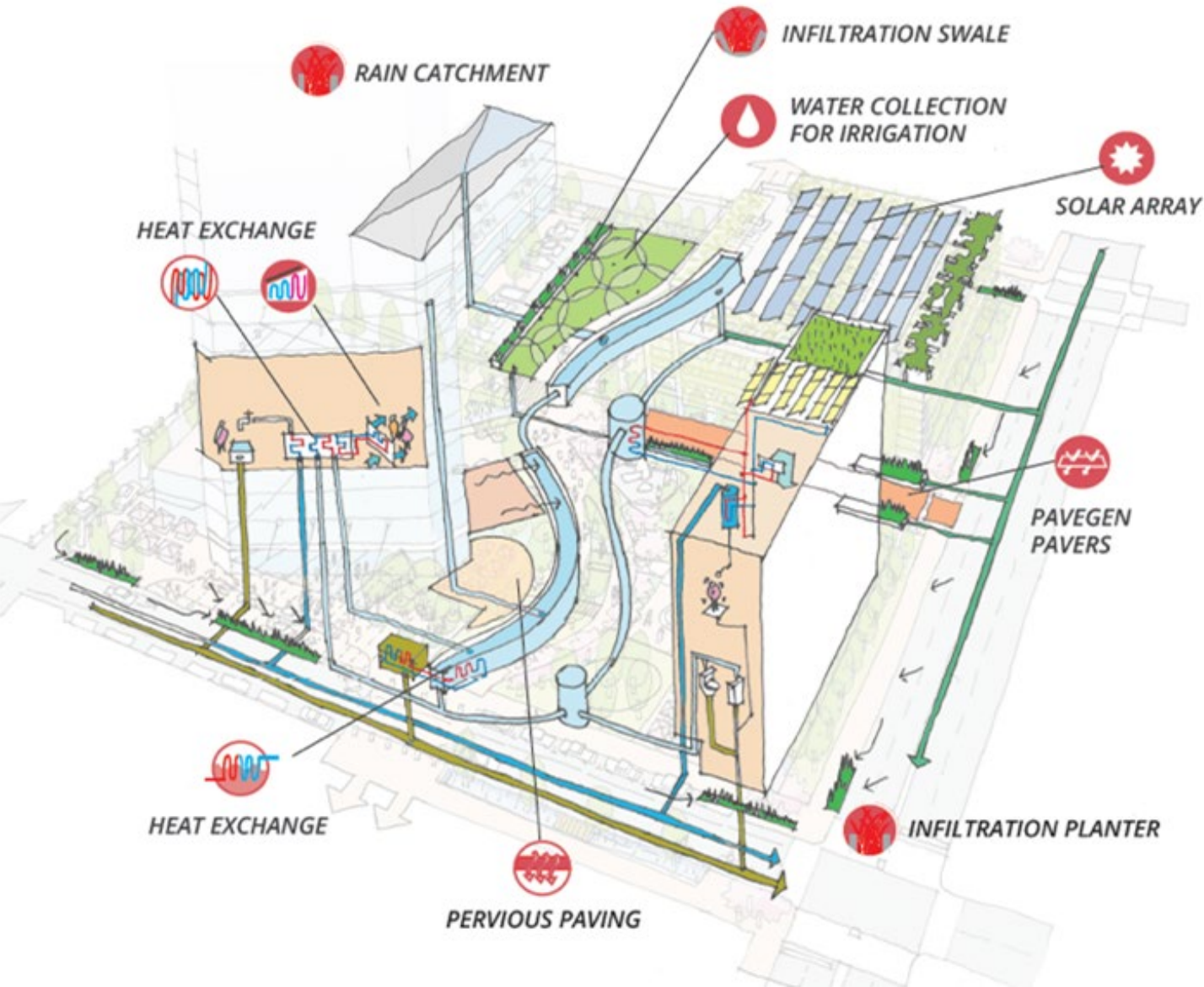
USES:

50% Residential
50% Commercial

Neighborhood
Restoration
Community
Governance

Linked outdoor spaces, Community Programs/ ICT
Green Infrastructure with 100% capture of water, heat, and nutrient for reuse
Mixed Use with jobs to housing ratio, 5:1 Jobs to housing ratio.
UDCK in SoMa with building and site with integrated water, heat, and waste cycling.

SITE INTEGRATION

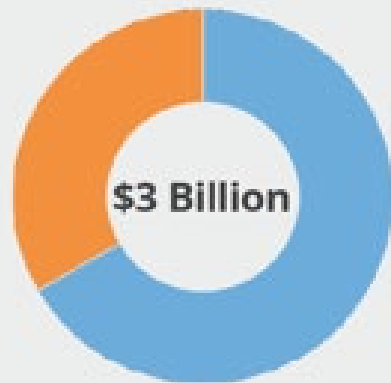


1. District Water With Heat Exchange:
2. Coordinated Blue-Green Infrastructure
3. Connected Blocks and Buildings
4. Integrated resource and material cycling.



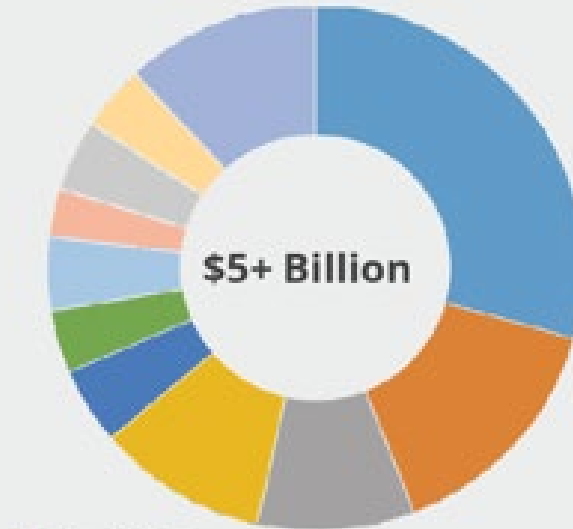
SUSTAINABLE SCALE OF THE SPATIAL ECONOMY

Market value
Established Plan



- In District (development benefits)
- Out of District (taxes)

Market value
With Regenerative Proposal



- In District
- Out of District
- Energy
- Water
- Waste
- Food
- Broadband
- Realtime Feedback
- EcoTourism
- Social Cost of CO₂
- Other

**Proforma Analysis,
\$2B+ in added
market value from
regenerative
performance!**

SUSTAINABLE SCALE OF THE ECONOMY: Albina Highway Covers Restorative Neighborhood, Portland OR



(1 Job / Resident)
100,000 SM
USES:
50% Residential
40% Commercial
10% Cultural

Neighborhood
Restoration
Community
Governance

Linked outdoor spaces activities to interior building programs.
Green Infrastructure with best management practices for regenerative systems sustainability
Mixed use district with potential for intergenerational wealth creation.
Governing entity to restore and maintain facilities and programs for Black Historic Albina Community.

SUSTAINABLE SCALE OF THE ECONOMY

Living building in a district economy



PAE, Portland Oregon
Living Building Challenge Certified

Transformed district economy



KOIL 2, Kashiwa no Ha, Chiba Prefecture
LEED ND Platinum Certified Smart City

GLOBAL PRACTICE AT THE SUSTAINABLE SCALE OF THE ECONOMY

- Use existing budgets to fund regenerative instead of degenerative solutions.
- Design new innovative governance structures
- To generate and coordinate regulations and investment that create the regenerative built environment, which in turn, creates sustainable urban economies for communities.



Thank You

Email us your questions or comments:

- Scott.Edmondson@sfgov.org
- Charles.Kelley@greenurbandesign.com

More information on regenerative sustainability and urbanism:

- sustainability2030.com/regenerative-region
- greenurbandesign.com
- zgf.com