MXD Infill Development Concept Plan

Sustainability Strategies

Wednesday, May 18, 2016

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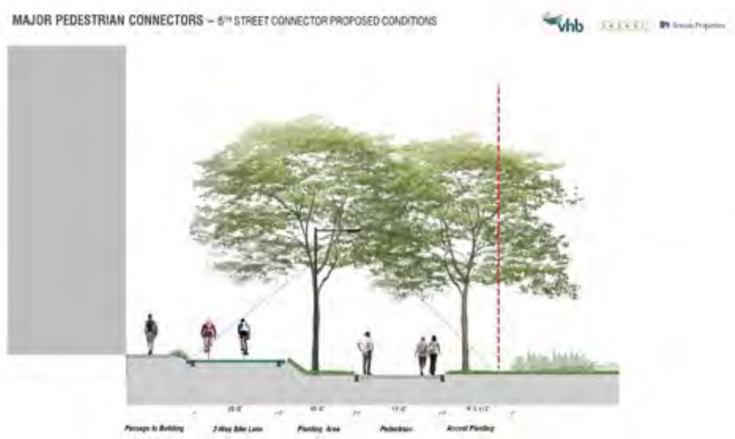
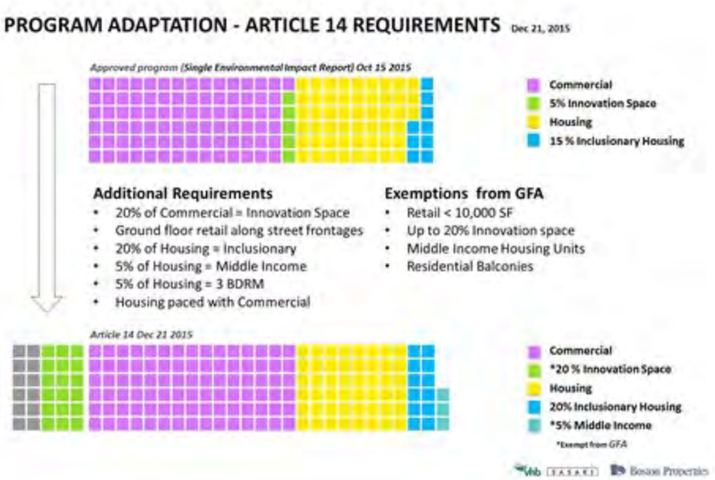
MEETING OVERVIEW

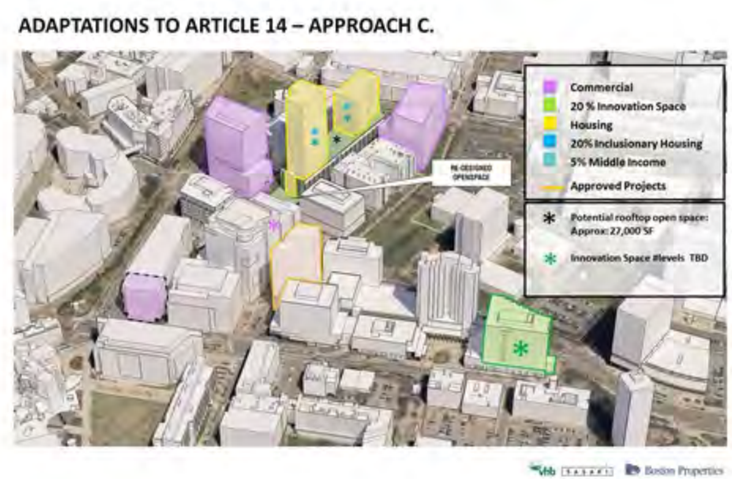
03/16/2016 MXD Infill Development: Open Space Concepts

04/13/2016 ECPT Open Space Concepts



04/27/2016 MXD Infill Development: Massing Development Program





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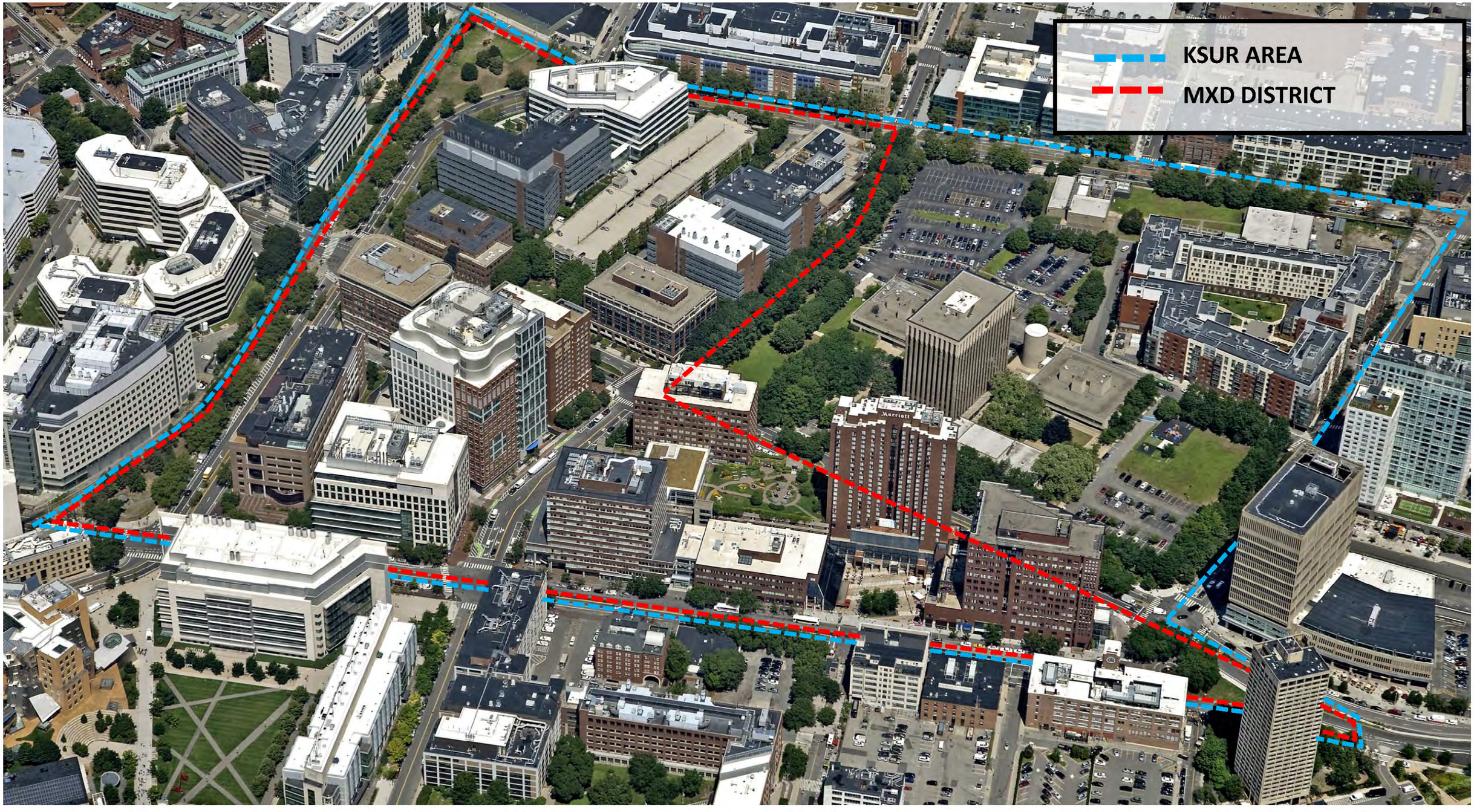
EXISTING SITE CONDITIONS 2015



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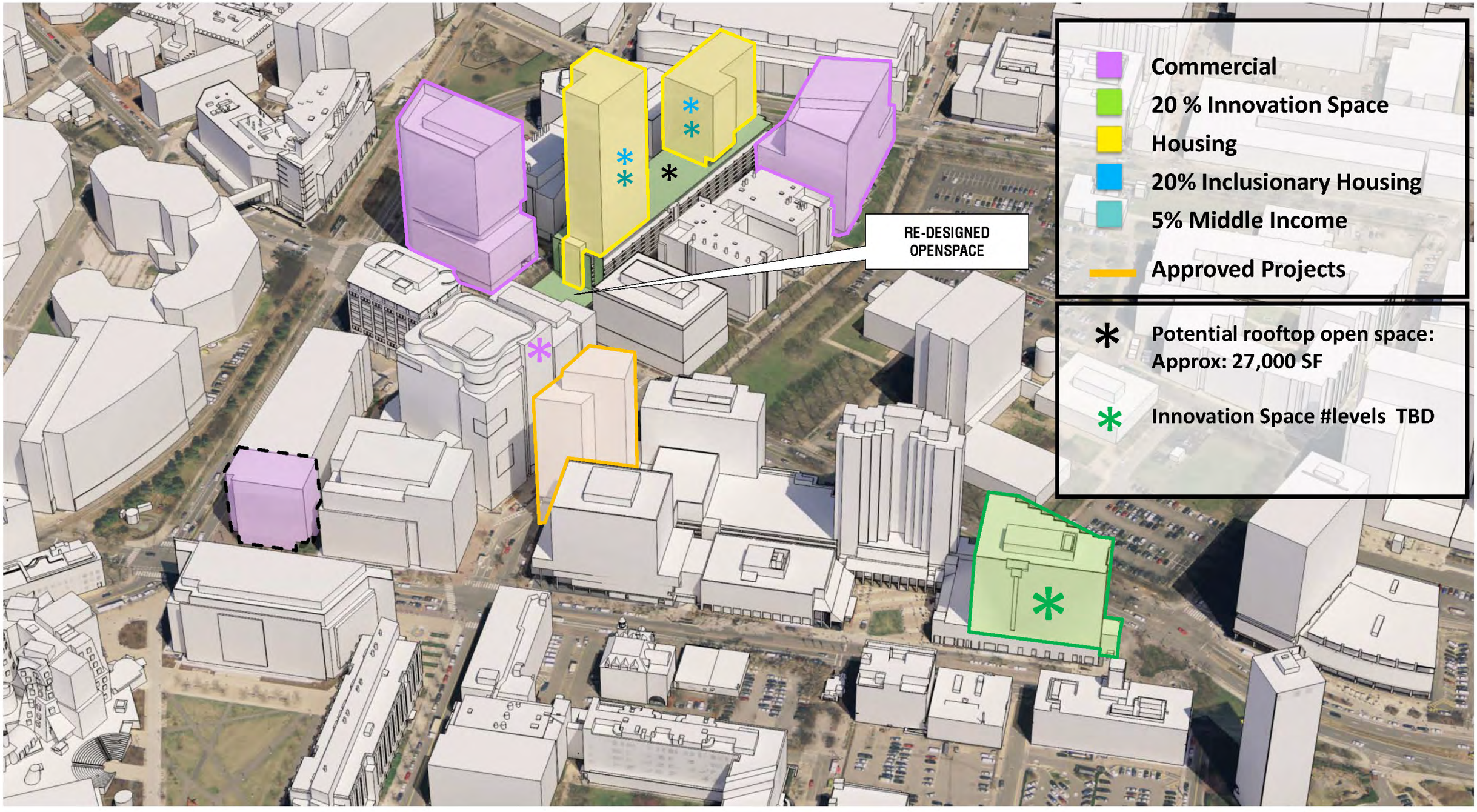
ADAPTATIONS TO ARTICLE 14 APPROACH C.



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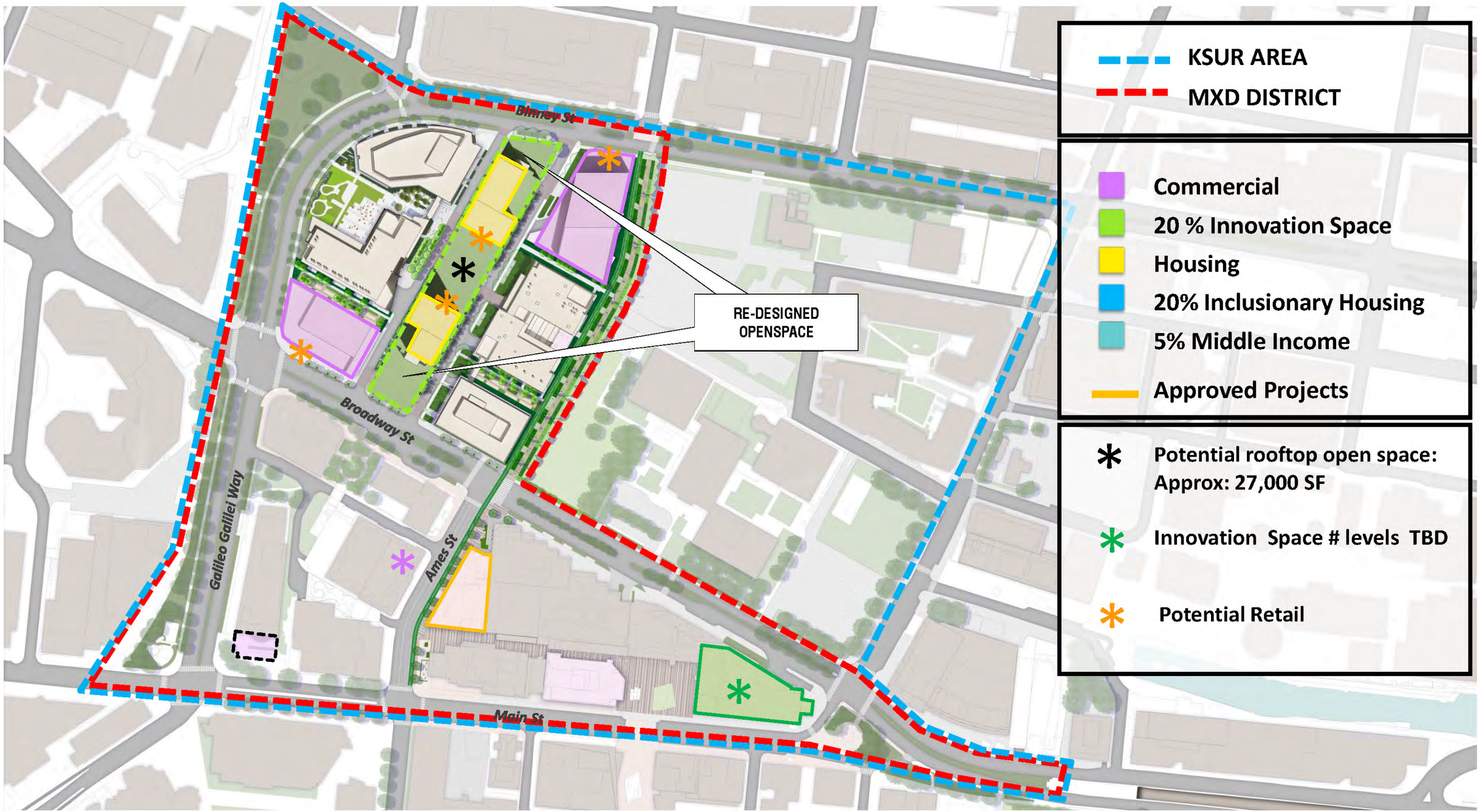
KENDALL SQUARE OPEN SPACE APPROACH C.



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SUSTAINABILITY CERTIFICATION AND RECOGNITION

- 15+ million square feet LEED Certified
- 80% at Gold and Platinum Level
- All new development projects, totaling 4.5 million square feet, are pursuing LEED certification

- Executive Members of EPA's Certification Nation program
- 52 ENERGY STAR labelled properties

- Ranked 2nd among US Office companies in 2015
- Ranked 24th out of 688 global companies in 2015 (among the top 4% of all participants)
- Achieved highest "Green Star" last 4 years

- 2014 Special Recognition – Most Improved Leader in the Light Award
- 2015 Leader in the Light Award Joint Winner

SUSTAINABILITY GOALS

We have adopted goals with the following specific time frames, metrics, and targets below a 2008 baseline:

15x20 Energy Use Reduction

Reduce energy use intensity, targets a 15% reduction by 2020. Units are kBtu/SF.

20x20 Greenhouse Gas Reduction

Reduce Scope 1 and Scope 2 greenhouse gas emissions intensity, targets a 20% reduction by 2020. Units are $kgCO_2e/SF$.

20x20 Water Use Reduction

Reduce water use intensity, targets a 20% reduction by 2020. Units are gallons/SF.

65x20 Waste Diversion

Increase waste diverted from landfill, targets a 65% diversion rate by 2020. Units are % diverted.

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SUSTAINABILITY HIGHLIGHTS

Established energy, greenhouse gas emissions, water and waste goals, with 2020 reduction targets below a 2008 baseline

Reduced like-for-like energy use by 6.7% in the last three years, saving an estimated $9.7 M in annual utility costs

Generated more than 1,000 MWh renewably onsite in 2015

Reduced water use intensity 17.8% since 2008, saving $1.7 M in annual utility costs

Increased our recycling rate from 36% in 2008 to 59% in 2015

Selected as a Green Lease Leader by the Better Buildings Alliance in 2015

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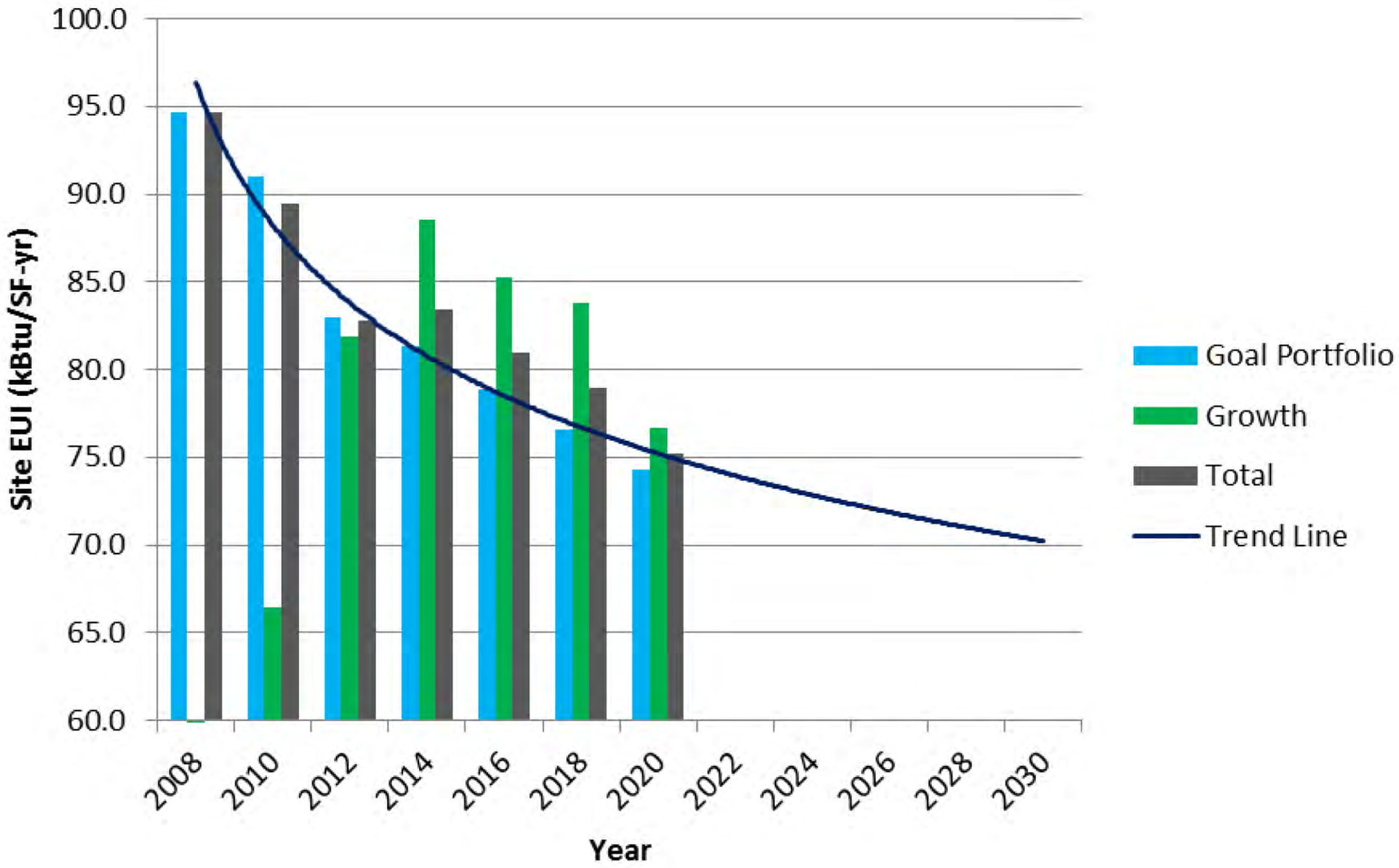
SITE ENERGY USE INTENSITY IMPROVEMENT OVER TIME



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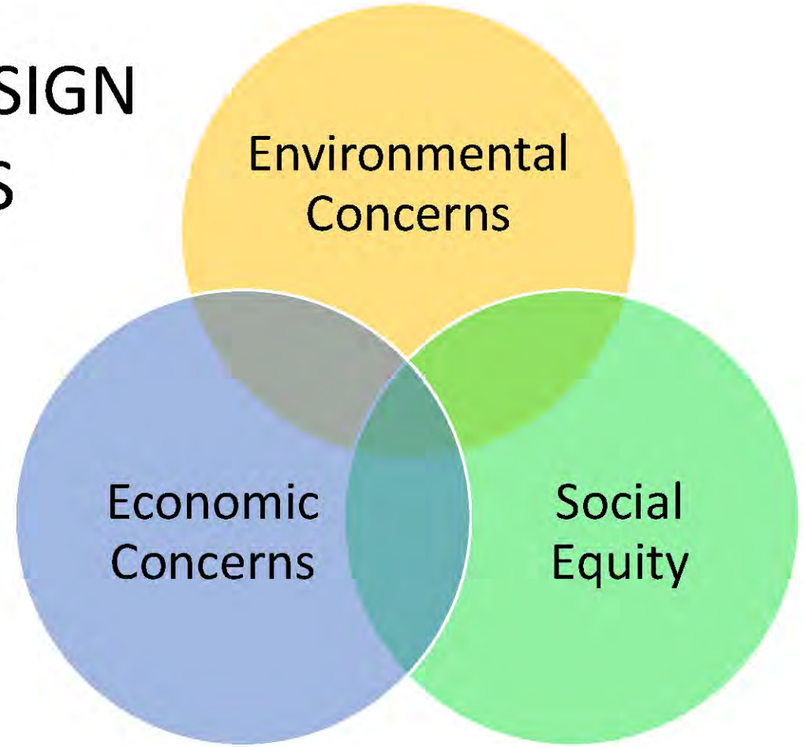
HIGHLIGHTS AND GOALS

OUTCOMES AND PERFORMANCE

- TARGET LEED V3 GOLD FOR ALL BUILDINGS
- LEED MASTER SITE APPROACH
- DISTRICT BASED APPROACHED TO SUSTAINABILITY
- INTEGRATIVE DESIGN PROCESS AND RESILIENT DESIGN
- INTERSECTION OF SUSTAINABILITY AND WELLNESS
- COMMITMENT TO OPERATIONAL SUSTAINABILITY



Triple Bottom Line

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INTEGRATIVE PROCESS

Systems thinking

Front-loaded process

Collaboration

Shared Ideas

Transparency

Accountability

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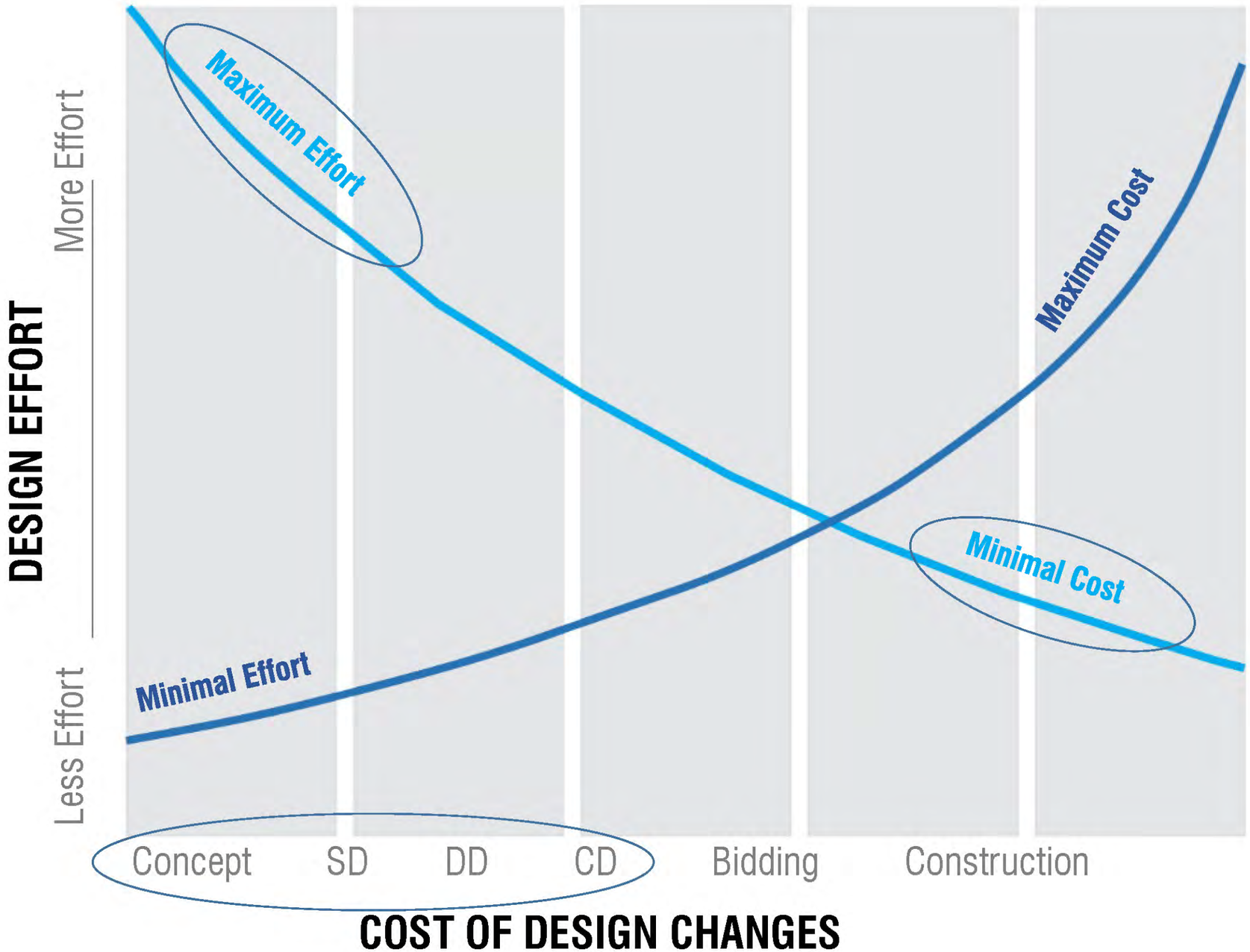
INTEGRATIVE PROCESS



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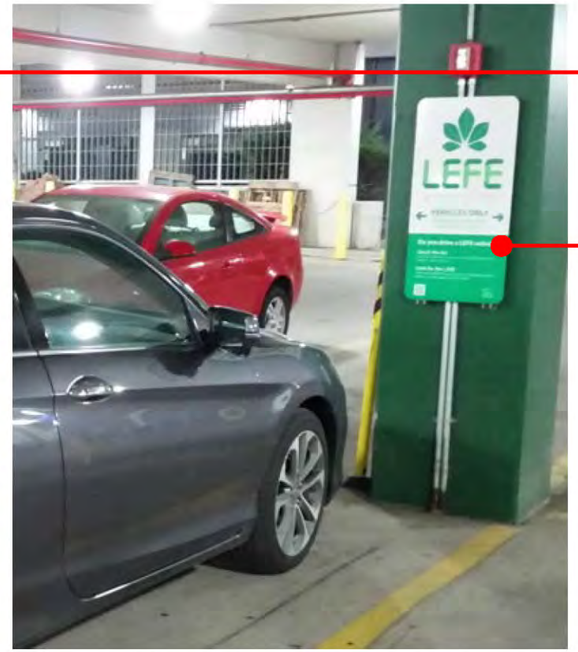
SITE AND WATER



- NATIVE / INDIGENOUS PLANTS
- LEFE PARKING, ESVE STATIONS, AND BIKE STORAGE
- DEMAND RESPONSE / PEAK LOAD REDUCTION SMART GRID COMPATIBILITY
- HEAT ISLAND REDUCTION

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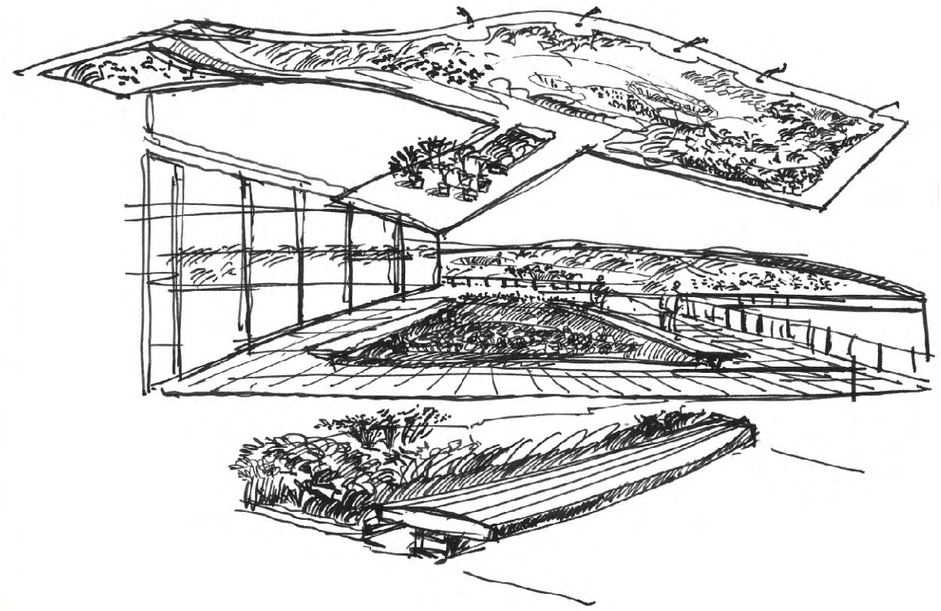
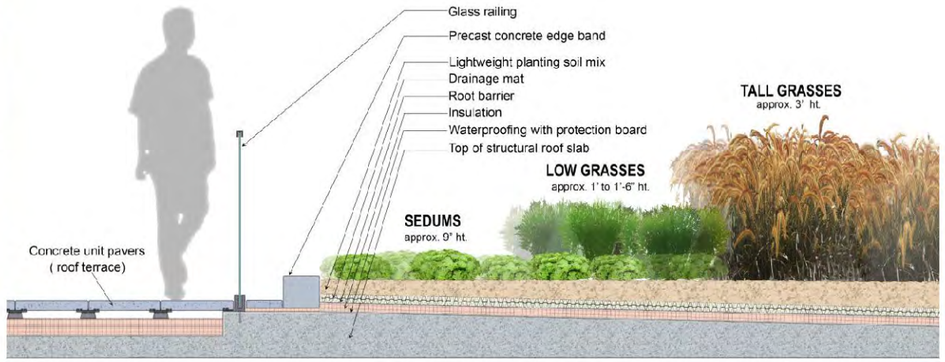
SITE AND WATER GREEN ROOFS





ROOF GARDEN SECTION

Manulife Headquarters– Boston, MA

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SITE AND WATER GREEN ROOFS

The Avenue – Square 54, Washington D.C

Bruce C. Bolling Municipal Building– Boston, MA

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SITE AND WATER STREET LEVEL OPEN SPACE HARVEST RAIN WATER GARDEN

The Avenue – Square 54, Washington D.C

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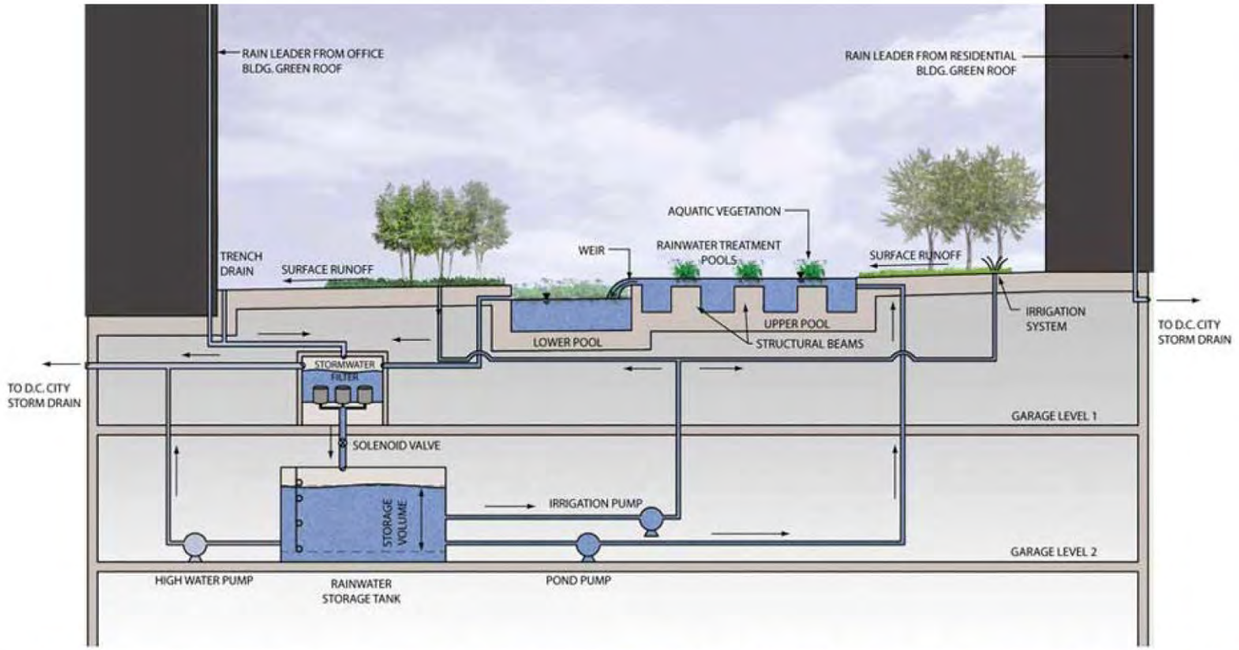
SITE AND WATER STORM WATER MANAGEMENT



The Avenue – Square 54, Washington D.C

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SITE AND WATER WATER USE REDUCTION

WaterSense
Meets EPA Criteria

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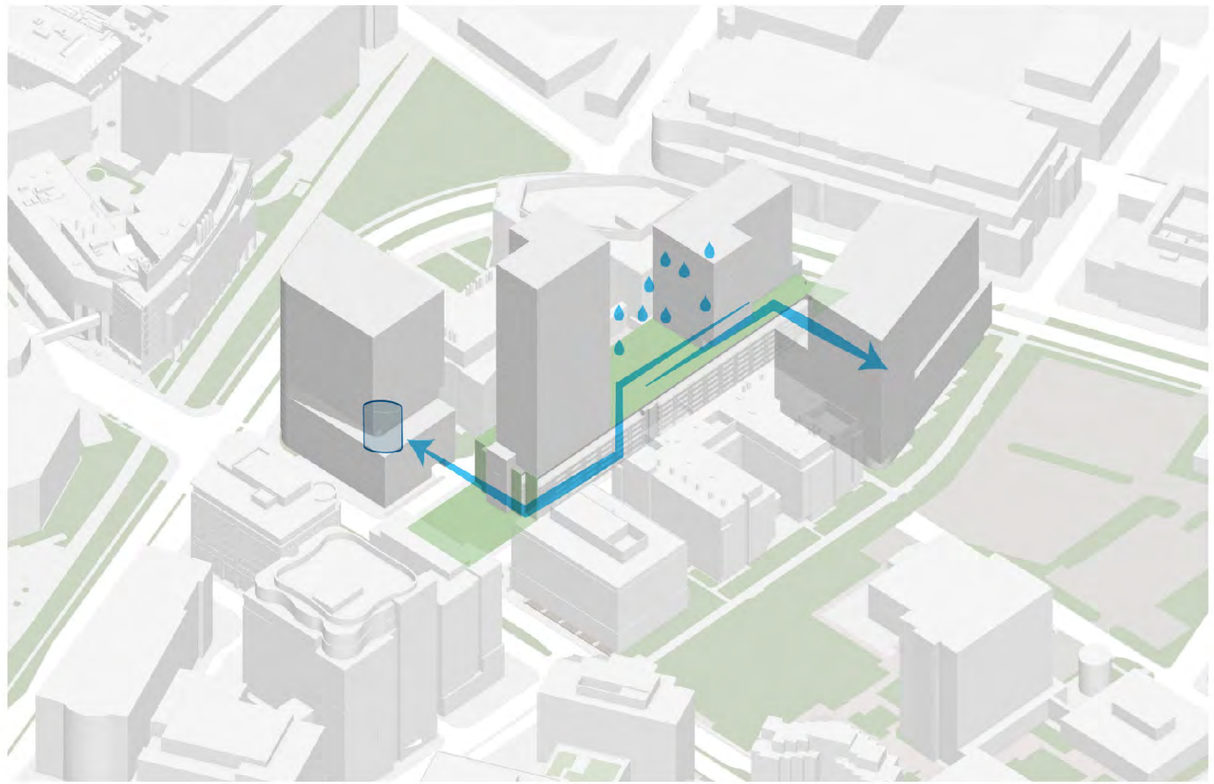
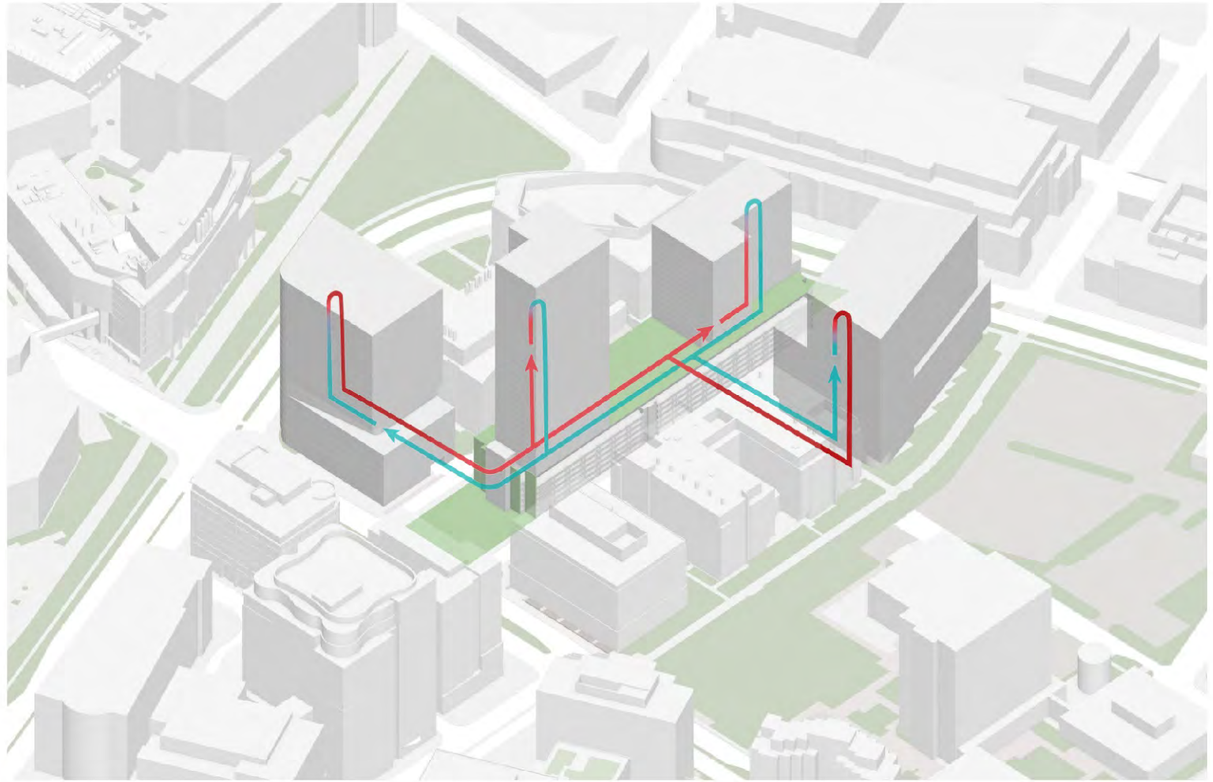
SITE AND WATER

- NON POTABLE WATER REUSE FOR IRRIGATION





- NON POTABLE WATER REUSE COOLING TOWER MAKEUP

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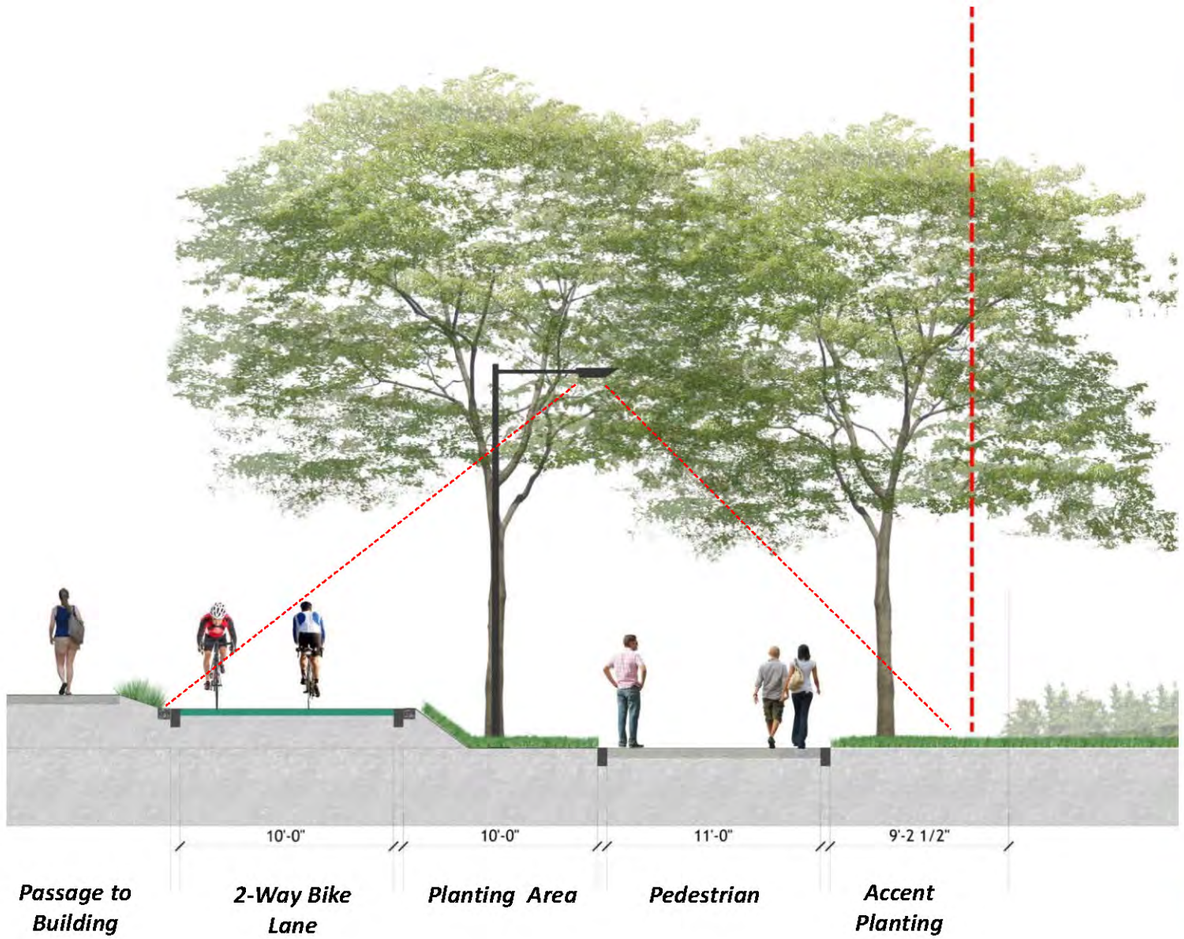
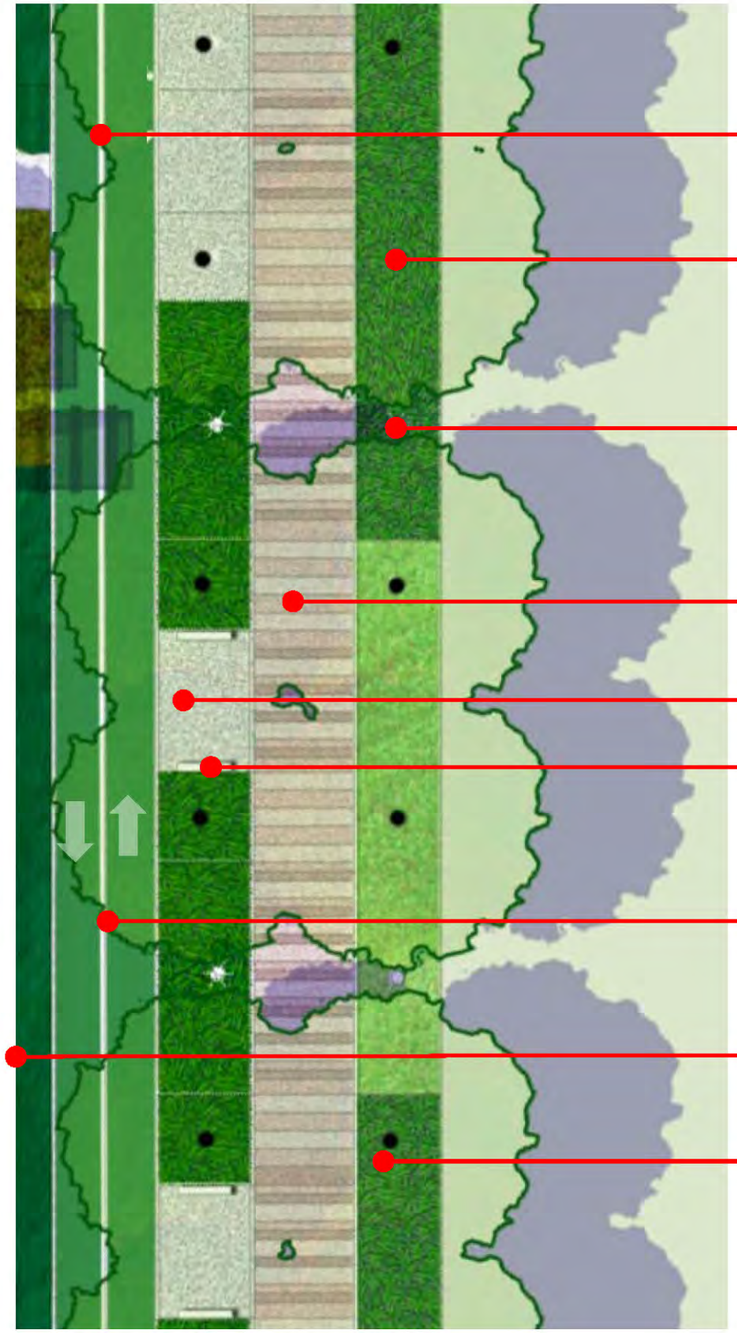
SITE AND WATER 6TH STREET CONNECTOR OPTIONS





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SITE AND WATER LIGHT POLLUTION REDUCTION

Full cut-off

Full cut-off downlight (LED)

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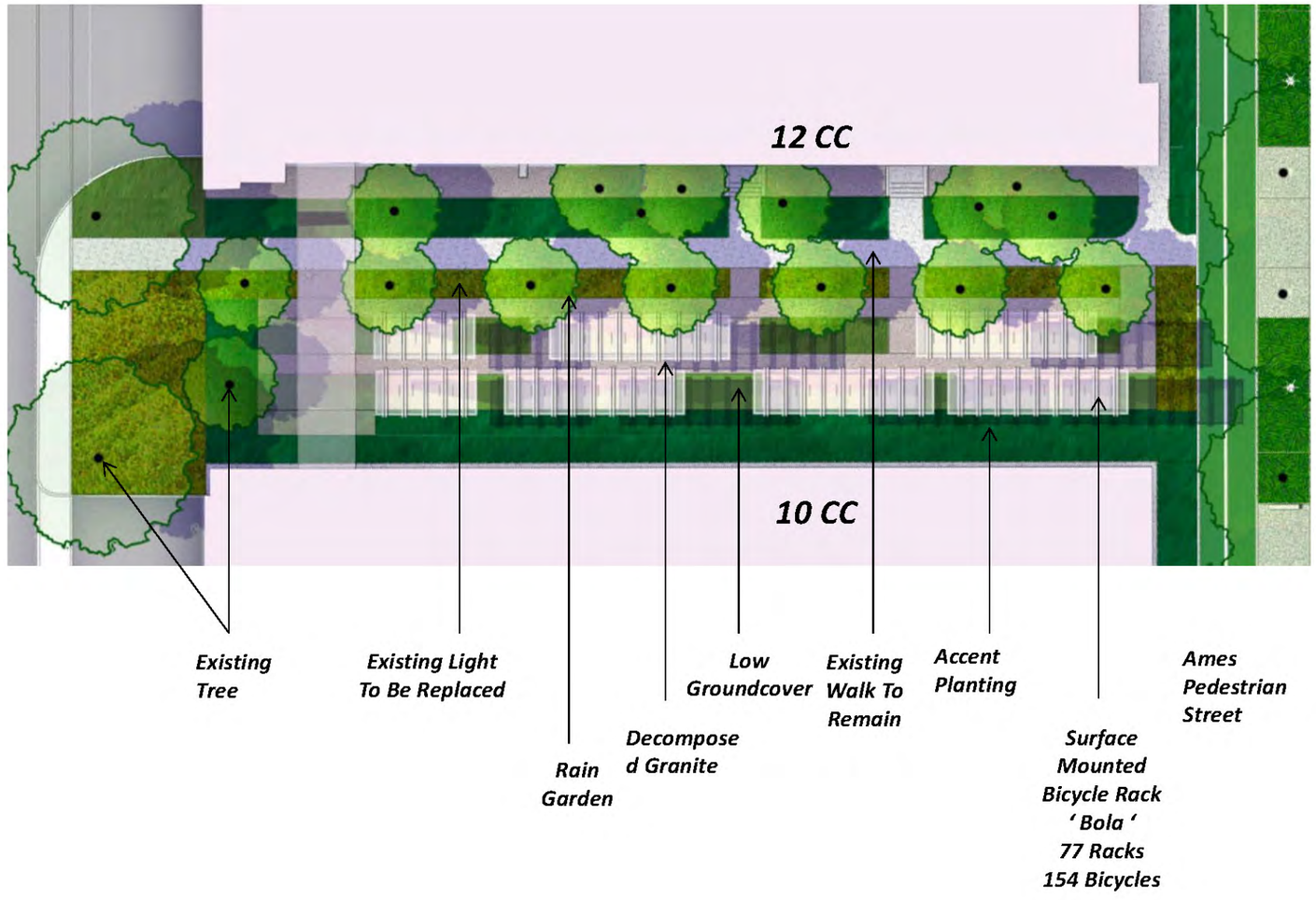
SITE AND WATER SOUTHEAST RAIN GARDEN OPTION



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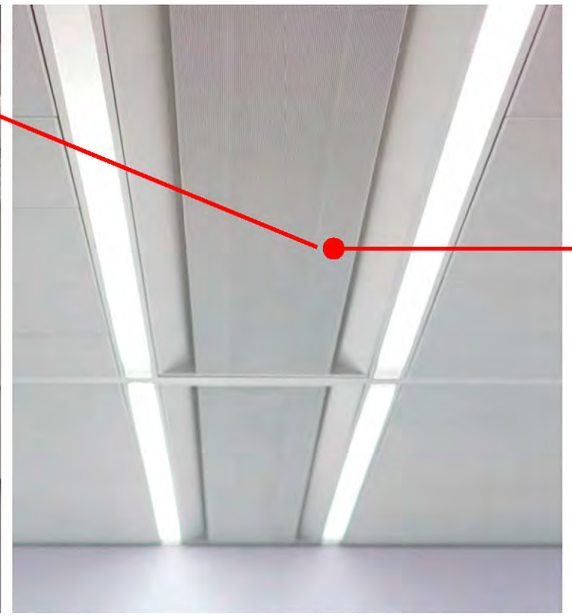
ENERGY



- CHILLED BEAMS
- DEMAND RESPONSE / PEAK LOAD REDUCTION / SMART GRID COMPATIBILITY
- SOLAR READY ROOFS

- HIGH PERFORMACE BUILDING ENVELOPE
- COMBINED HEAT AND POWER (CHP) COGEN BOILER

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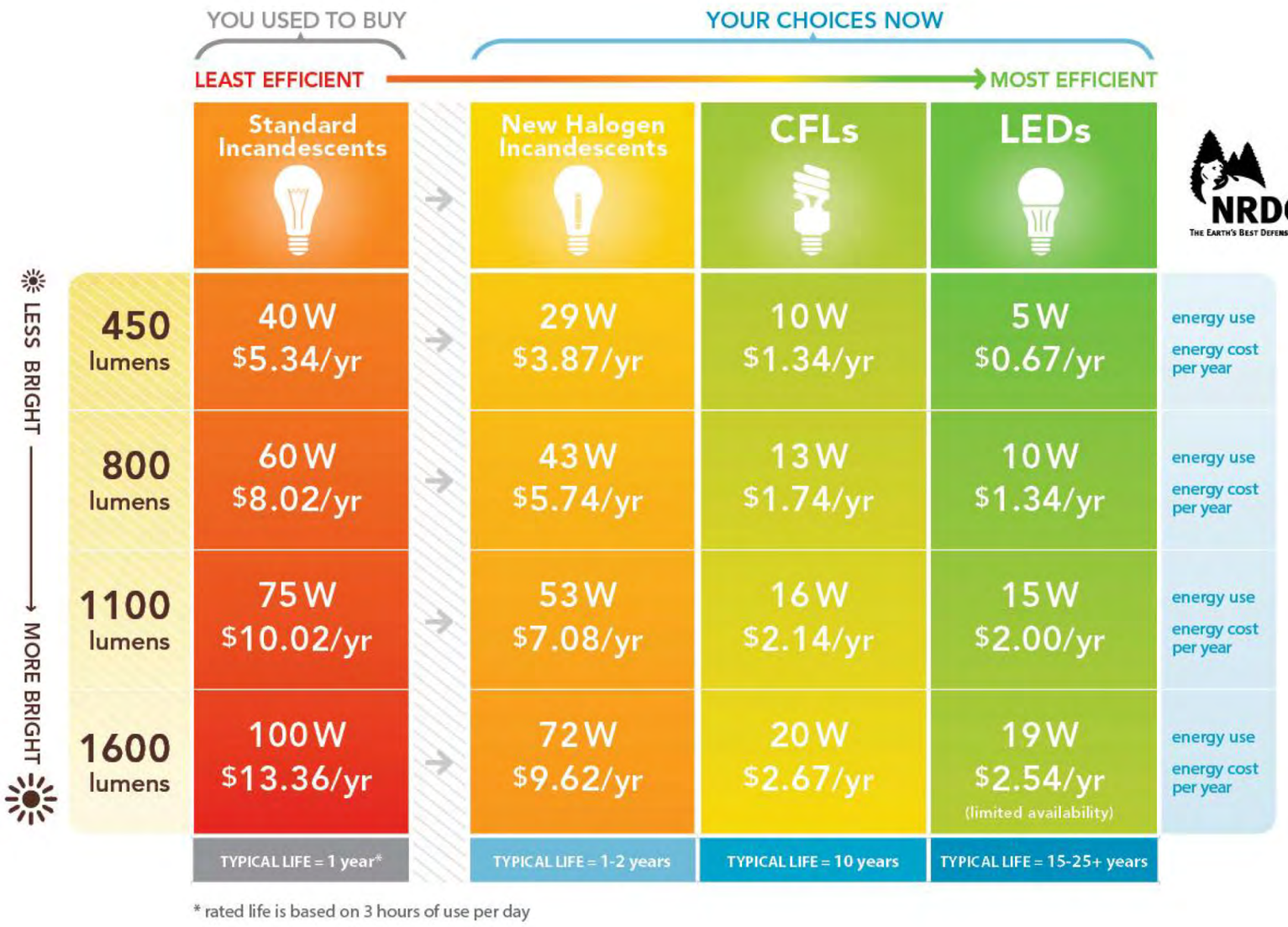
LIGHTING



* rated life is based on 3 hours of use per day

100w
Incandescent
$13.36/yr
1 yr lifespan

20w
CFL
$2.67/yr
10 yr lifespan

19w
LED
$2.54/yr
15-25 yr lifespan

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MATERIALS AND OCCUPANT HEALTH AND COMFORT

Performance

Transparency

Nutrition Facts

Serving Size 8 Crackers (29g)

Amount Per Serving	
Calories 130	Calories from Fat 35
	% Daily Value*
Total Fat 4g	**6%**
Saturated Fat 1.5g	**8%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 135mg	**6%**
Total Carbohydrate 22g	**7%**
Dietary Fiber less than 1g	**2%**
Sugars 7g	
Protein 2g	

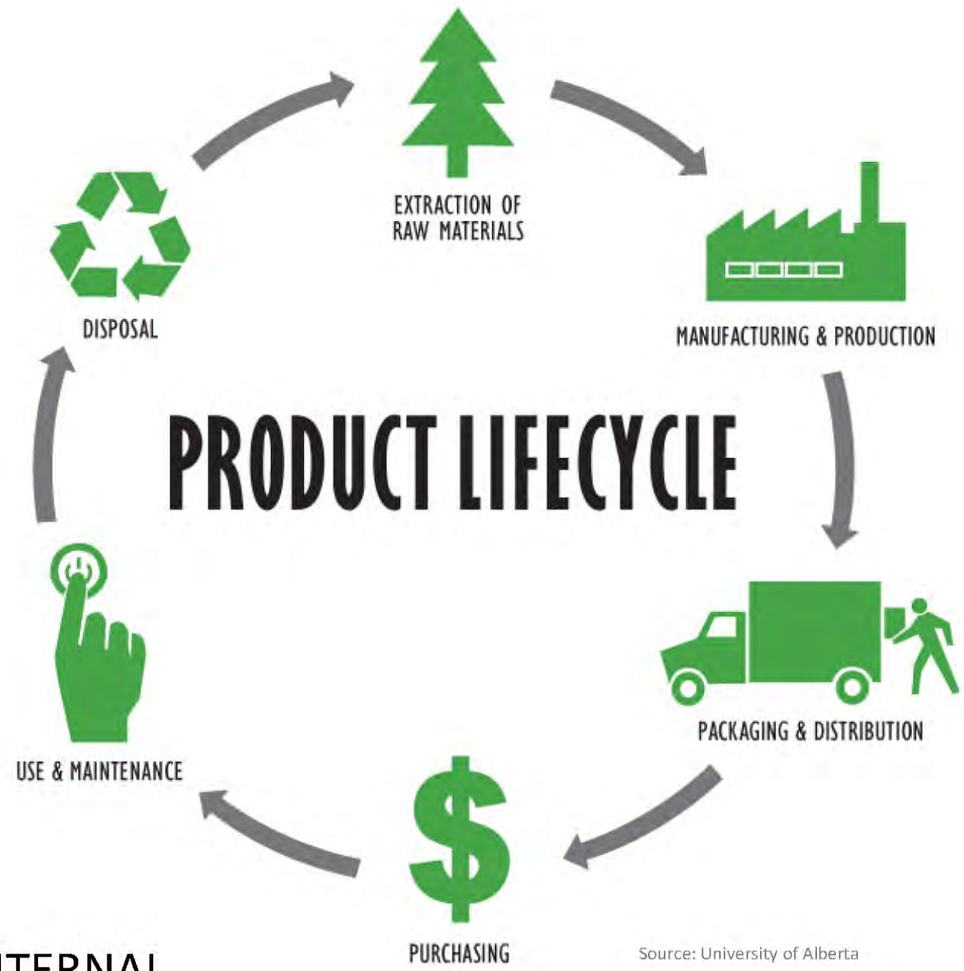
Vitamin A 0% • Vitamin C 0% • Calcium 10% • Iron 4%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat. Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

INGREDIENTS: ENRICHED FLOUR (WHEAT FLOUR, NIACIN, REDUCED IRON, THIAMIN MONONITRATE [VITAMIN B_1], RIBOFLAVIN [VITAMIN B_2], FOLIC ACID), SUGAR, VEGETABLE OIL (SOYBEAN AND PALM OIL WITH TBHQ FOR FRESHNESS), DEGERMINATED YELLOW CORN FLOUR, HIGH FRUCTOSE CORN SYRUP, CONTAINS TWO PERCENT OR LESS OF CALCIUM CARBONATE, SALT, LEAVENING (BAKING SODA, SODIUM ACID PYROPHOSPHATE), NATURAL FLAVOR (CONTAINS MILK), SOY LECITHIN, MOLASSES.

CONTAINS WHEAT, MILK AND SOY INGREDIENTS. MAY CONTAIN TREE NUTS.



Source: University of Alberta

- BOSTON PROPERTIES INTERNAL PRECAUTIONARY REDLIST
- LIFE CYCLE ANALYSIS
- NO SMOKING BUILDINGS AND SITE

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OPERATIONS

- GREEN TENANT GUIDELINES AND LEASING AGREEMENTS
- RECYCLING AND GREEN CLEANING
- BUILDING AND ENVELOPE COMISSIONING
- BUILDING DASHBOARDS
- SMART BUILDING CONTROLS
  REMOTE ACCESS CONTROLS

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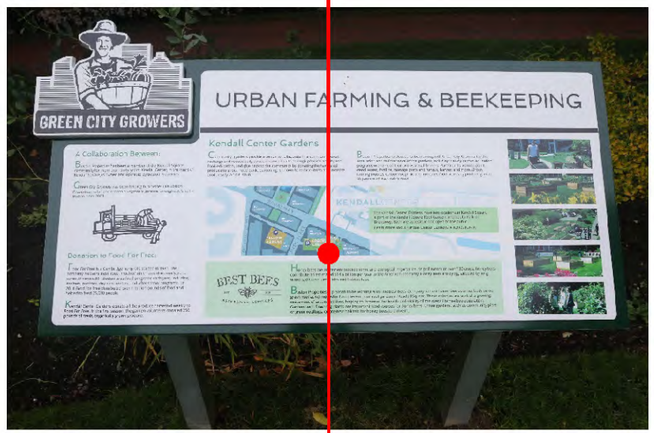
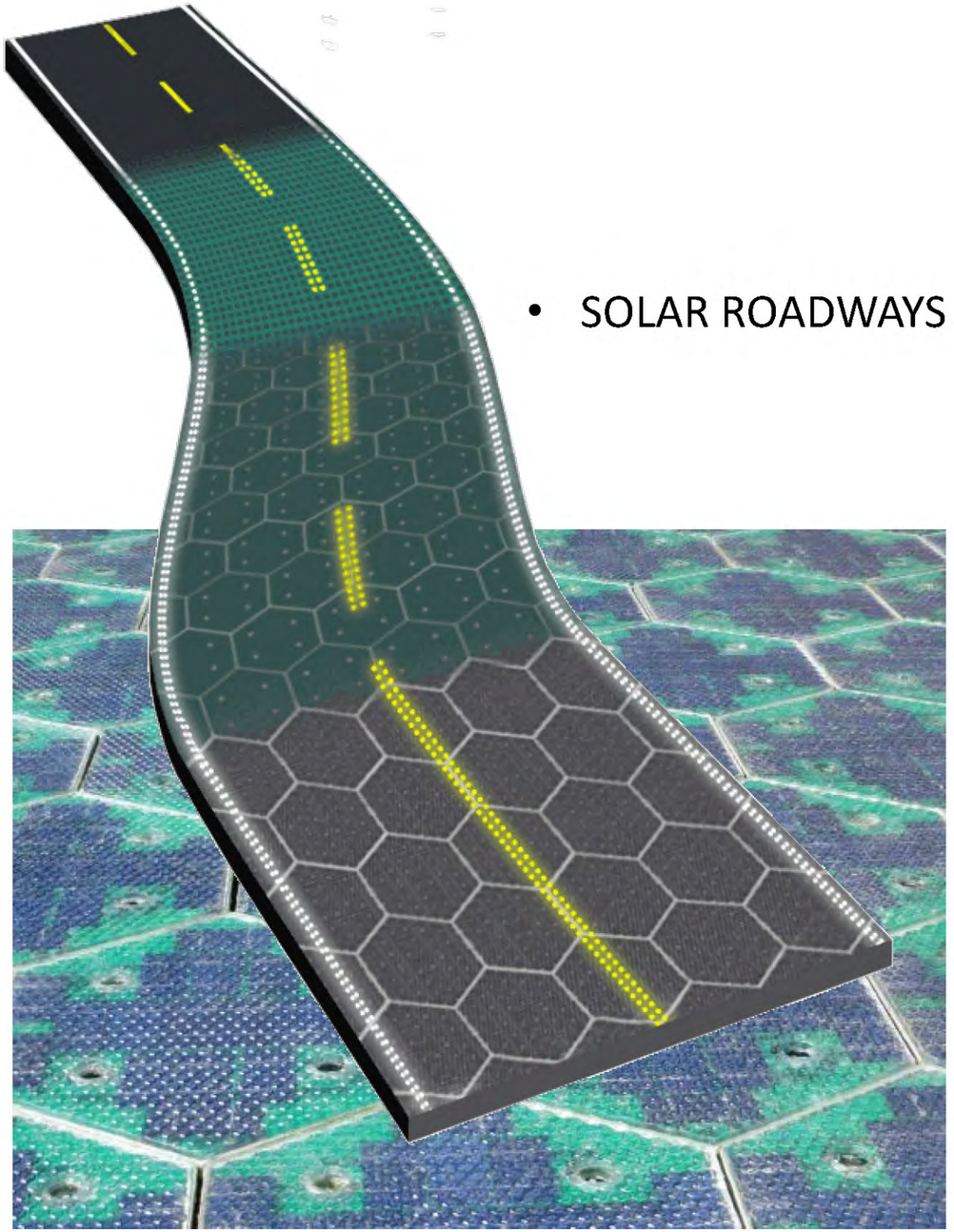
INNOVATION AND EMERGING TECHNOLOGIES

- LOCAL FOOD / COMMUNITY GARDENS



- SOLAR ROADWAYS



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Buildings use 40% of raw materials globally (3 billion tons annually).

- Worldwatch Institute, 1995.

Buildings account for 73% of all electricity use in the United States.

- U.S. Department of Energy, 2012.

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