

An aerial photograph of the Belmont Public Library and its surroundings. The library building is a large, multi-story structure with a prominent central tower. It is surrounded by a large parking lot filled with cars. To the left of the library is a large, open field. To the right is a dense forest. A road runs along the bottom of the image, with several cars parked along the side. The text "Belmont Public Library" is overlaid in white, bold, sans-serif font, centered horizontally and partially overlapping the library building and the parking lot.

# Belmont Public Library

LBC Meeting #4 January 22, 2019

Oudens Ello Architecture



An aerial photograph of a school campus, featuring a large central building, several parking lots filled with cars, and a multi-lane road running diagonally across the scene. The image is overlaid with a semi-transparent dark grey filter.

# Project Schedule





	Jan <b>26</b> SAT 10:00 AM 2:00 PM	Jan <b>26</b> SAT 2:00 PM 6:00 PM	Jan <b>29</b> TUE 3:00 PM 7:00 PM	Jan <b>31</b> THU 3:00 PM 7:00 PM	Feb <b>2</b> SAT 10:00 AM 2:00 PM	Feb <b>2</b> SAT 2:00 PM 6:00 PM
13 participants +	✓9	✓8	✓5	✓11	✓10	✓10
👤 Noel Murphy	✓	✓	✓	✓	✓	✓
👤 Sara Eardensohn	✓	✓		✓		
👤 Conrad Ello 	✓	✓		✓	✓	✓
👤 Bob mcLaughlin			✓	✓		
👤 Sally Martin	✓	✓			✓	✓
👤 Heli Tomford			(✓)	✓	(✓)	✓
👤 Kathy Keohane	✓	✓		(✓)	✓	✓
👤 Stephen Sala	✓	✓				
👤 Steve Engler				✓	(✓)	(✓)
👤 Peter Struzziero	✓			✓	✓	✓
👤 Frances Hughes	✓	✓		✓	✓	✓
👤 Bob Schafer	✓	✓	✓	✓	✓	✓
👤 Clair Colburn			✓	✓	✓	✓

#### BPL Central Library Hours:

- 9 AM - 9 PM on Thursdays
- 9 AM - 5 PM on Saturdays

#### Cambridge Public Library - Main Library Hours:

- 9 AM - 9 PM on Thursdays
- 9 AM - 5 PM on Saturdays

## Benchmarking Visits



An aerial photograph of a school campus, featuring a large central building, several parking lots filled with cars, and a multi-lane road running diagonally across the frame. The image is overlaid with a semi-transparent dark grey filter.

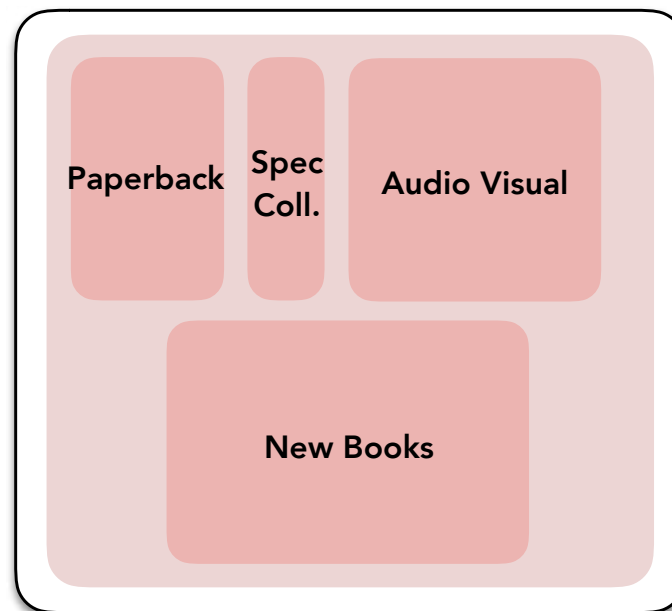
# Program Update



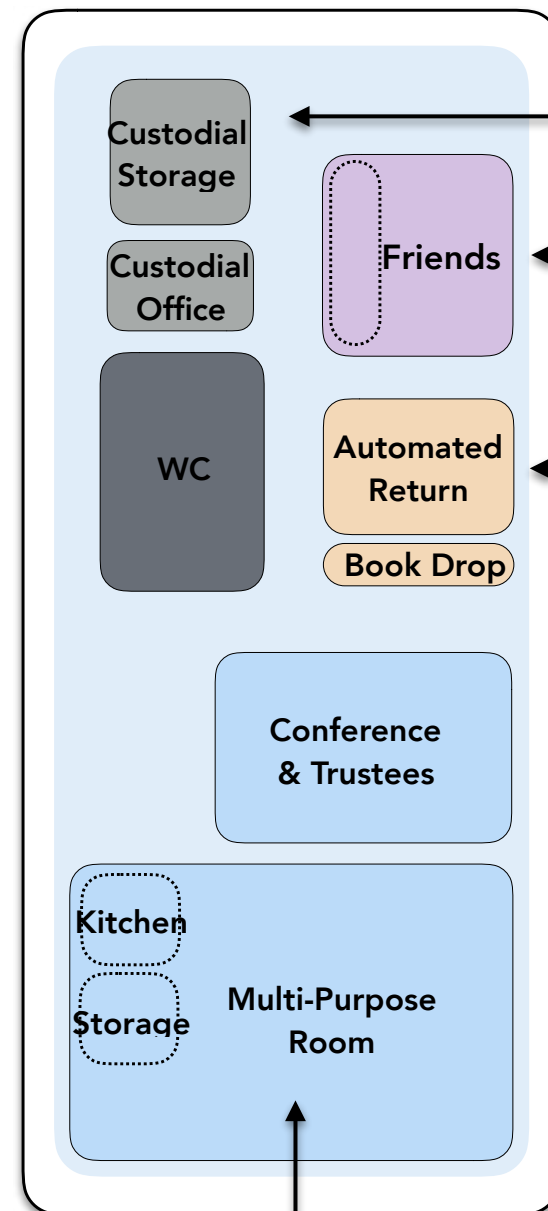
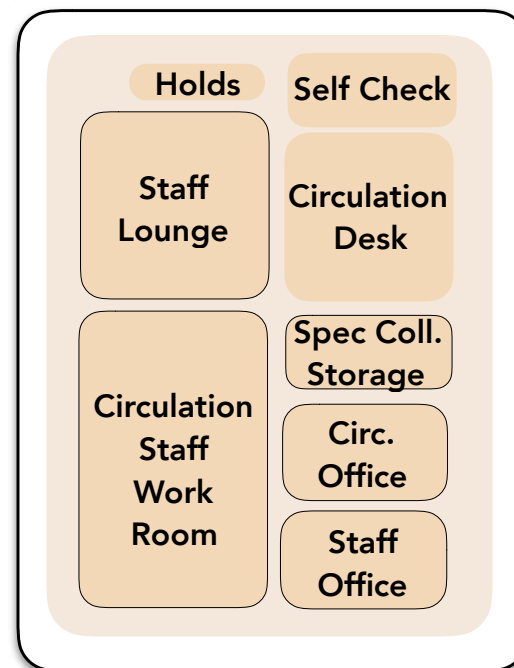
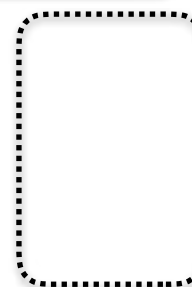
AREA COMPARISON	Existing Area	2017 Feasibility Study	2018 Adjustments	Notes:
CIRCULATION & STAFF AREAS	3,324 SF	3,200 SF	3,725 SF	Addition of Automated Return, Book Drop, Patrons Hold, Special Collections Storage
POPULAR MATERIALS	500 SF	2,000 SF	2,100 SF	Section for Special Collections 'Rentable' Items
MEETING ROOMS	1,637 SF	2,200 SF		
MAKER SPACE		350 SF		
ADULT COLLECTIONS & READING	7,200 SF	7,330 SF		
INFORMATION SERVICES	2,000 SF	4,100 SF	4,400 SF	Addition of (3) Study Rooms
LOCAL HISTORY ROOM (CLAFLIN ROOM)	740 SF	755 SF		
PERIODICALS		825 SF		
FRIENDS		500 SF	600 SF	Addition of Storage / Donation Space
YOUNG ADULT / TEEN	700 SF	1,400 SF		
CHILDREN'S DEPARTMENT	2,870 SF	6,625 SF	6,650 SF	Addition of Self Check-out at desk
CUSTODIAL & STORAGE	1,760 SF	725 SF		
Total Program Area	20,731 SF	30,010 SF	31,060 SF	
Non Assigned	8,919 SF	(27%) 8,183 SF	(42%) 13,311 SF*	*Assumes 70% Net to Growth Efficiency
<b>Gross Building Area</b>	<b>29,650 SF</b>	<b>38,492 SF</b>	<b>44,371 SF</b>	

Program Summary





Vertical  
Circulation  
Core



Deliveries & Service

Donations

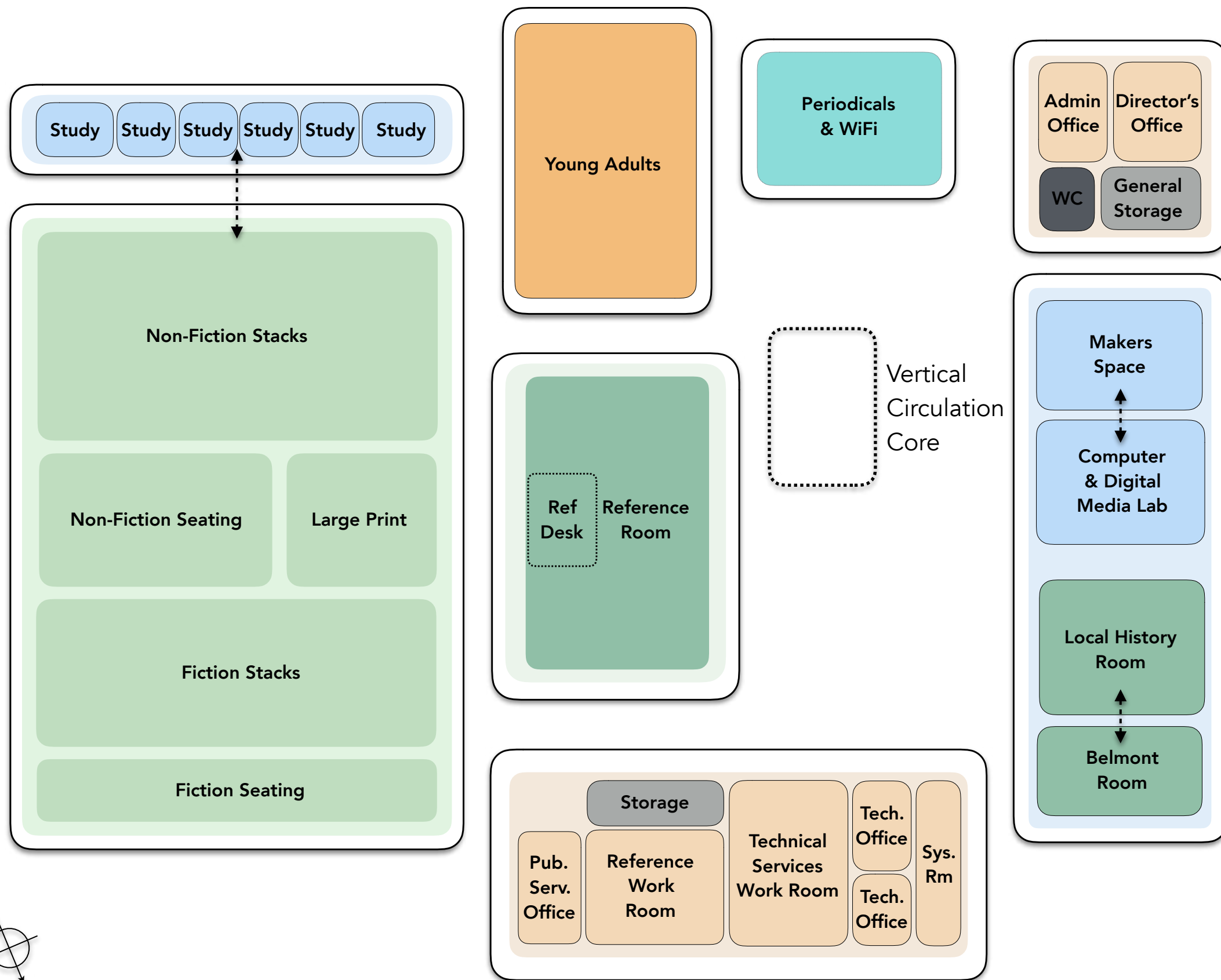
Returns

Visitor Arrival  
From Parking  
and Drop-off



Program Diagram - First Floor Level

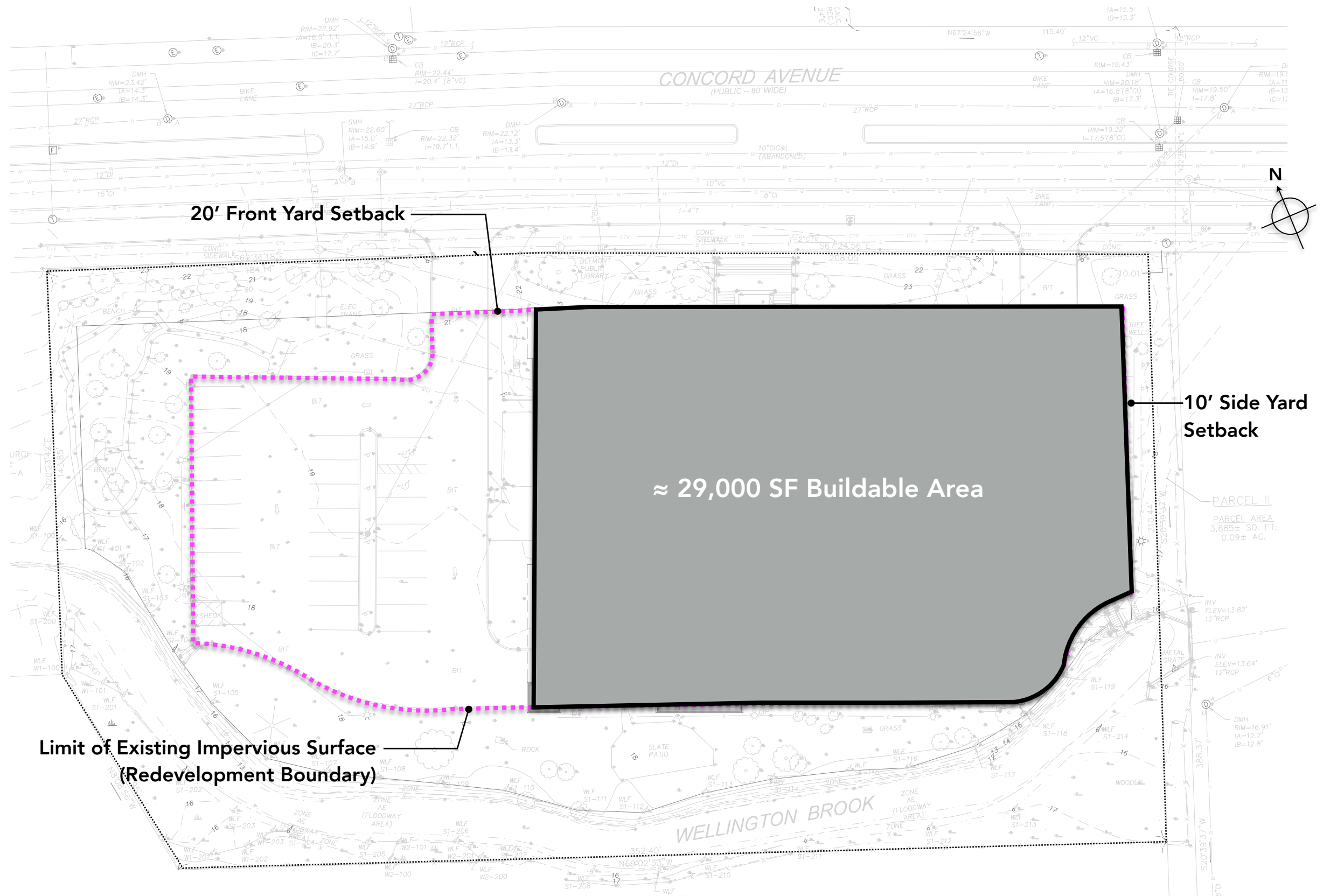




Program Diagram - Second Floor Level





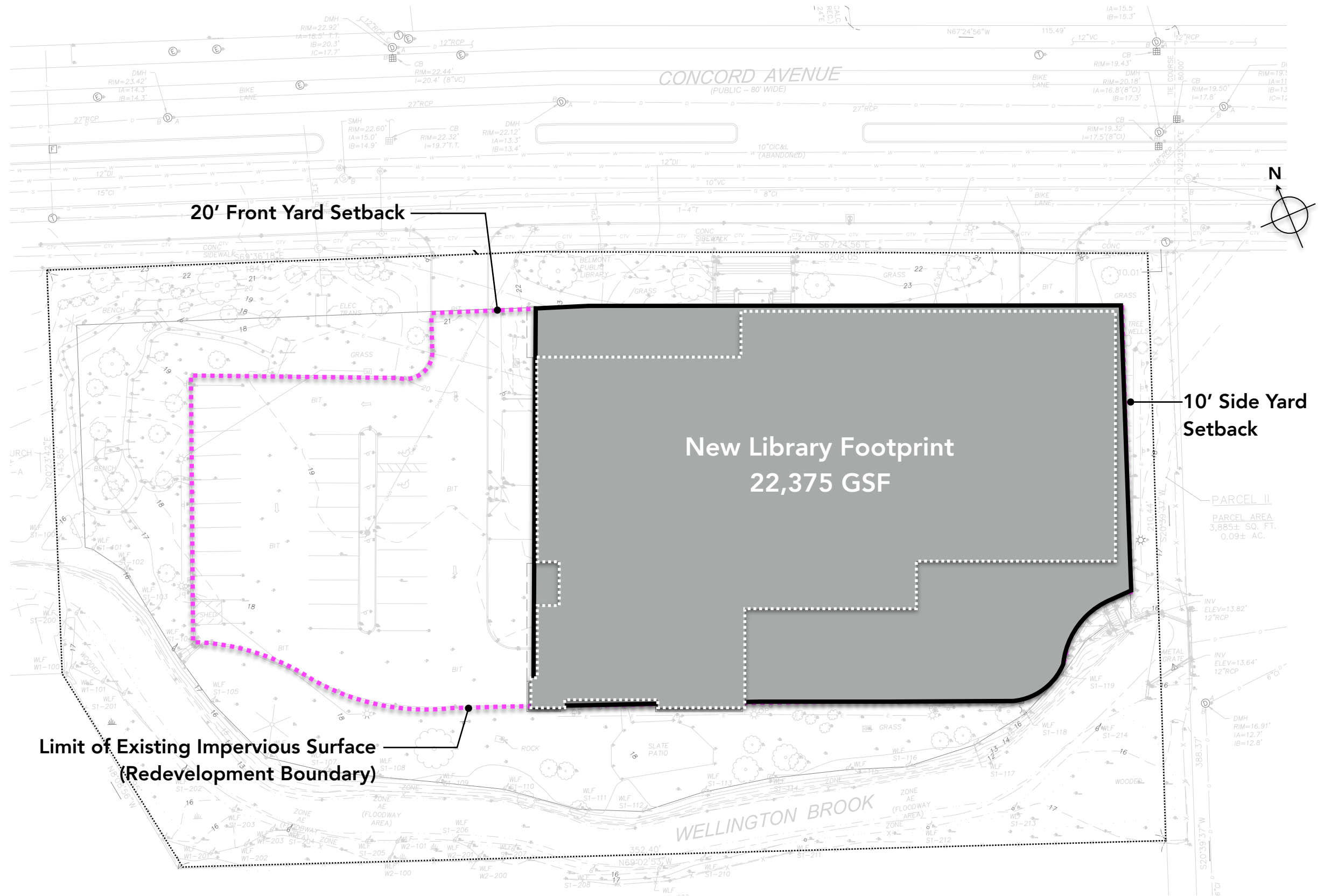


**Site Analysis - Buildable Area**



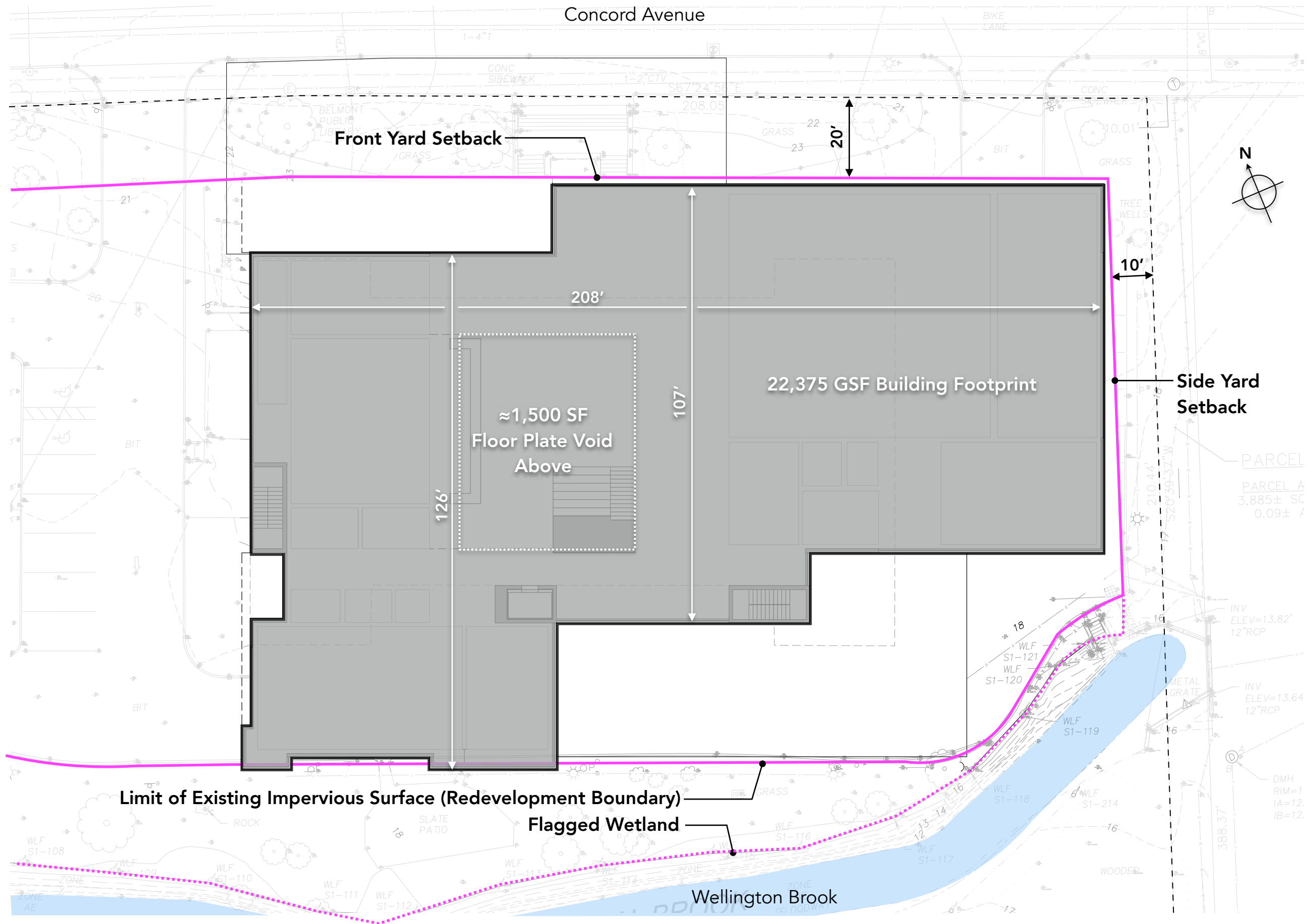


Site Analysis - Buildable Area

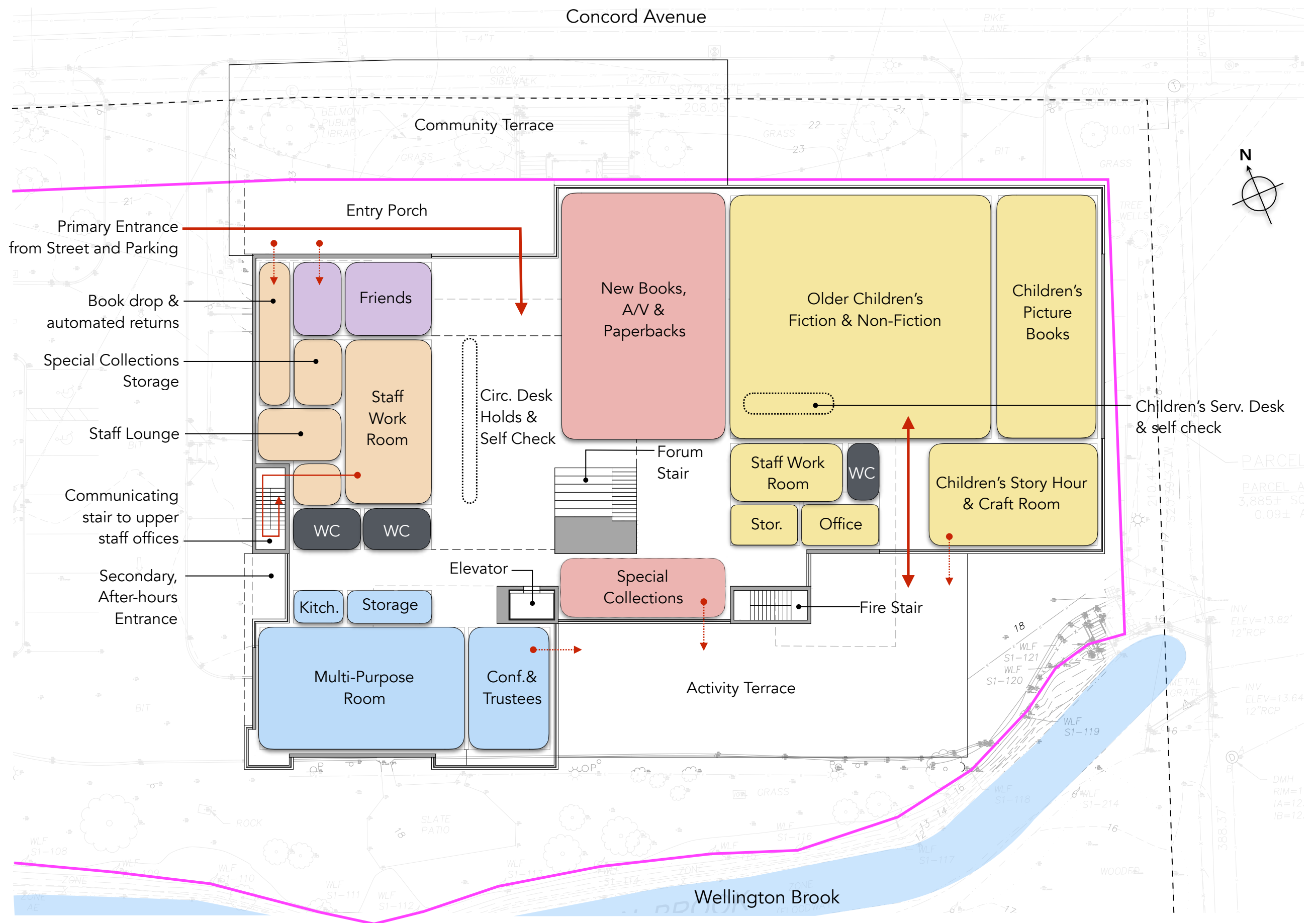


Site Analysis - Buildable Area



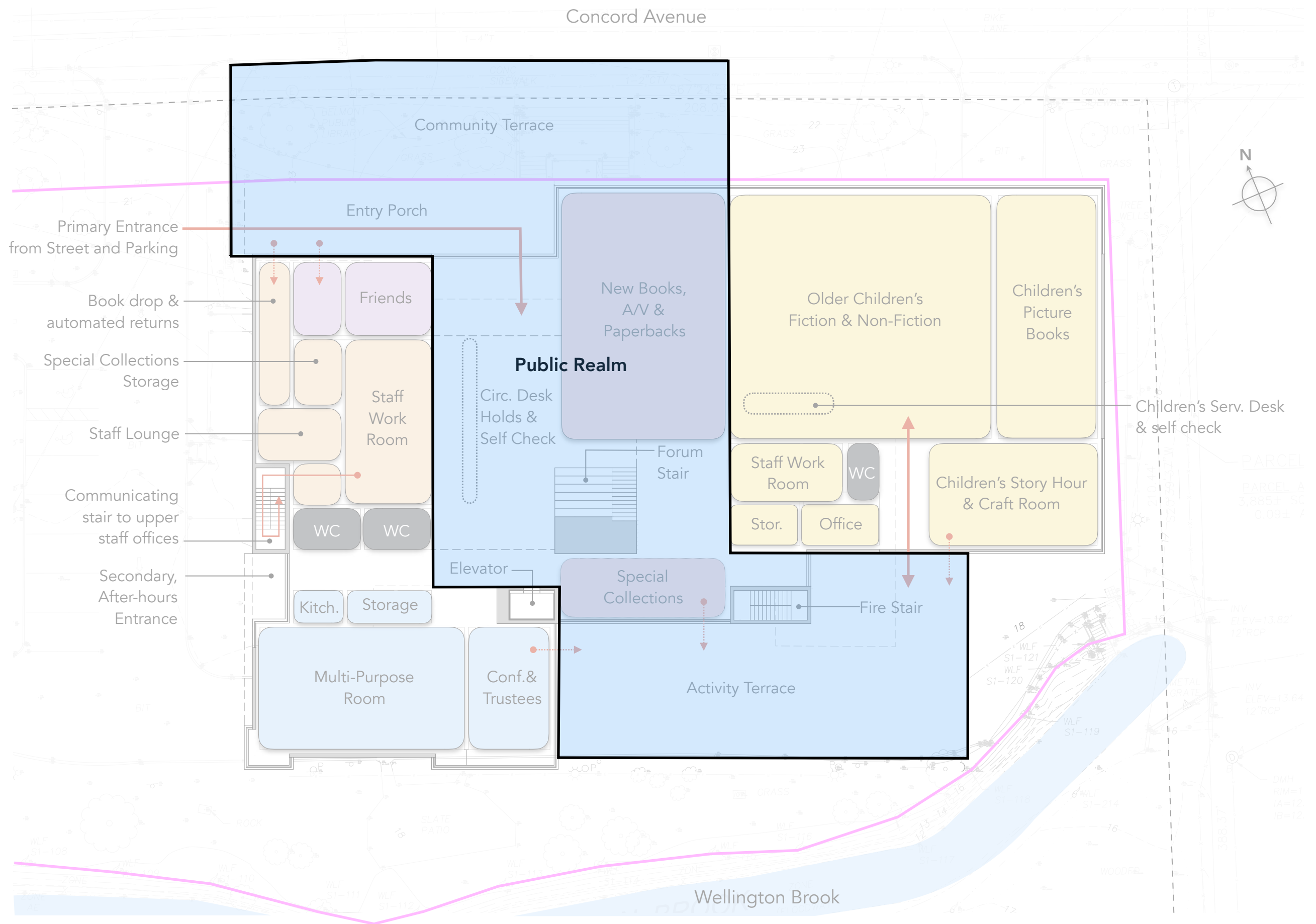


**OPTION 1 - Footprint** (43,500 GSF total on two floors)

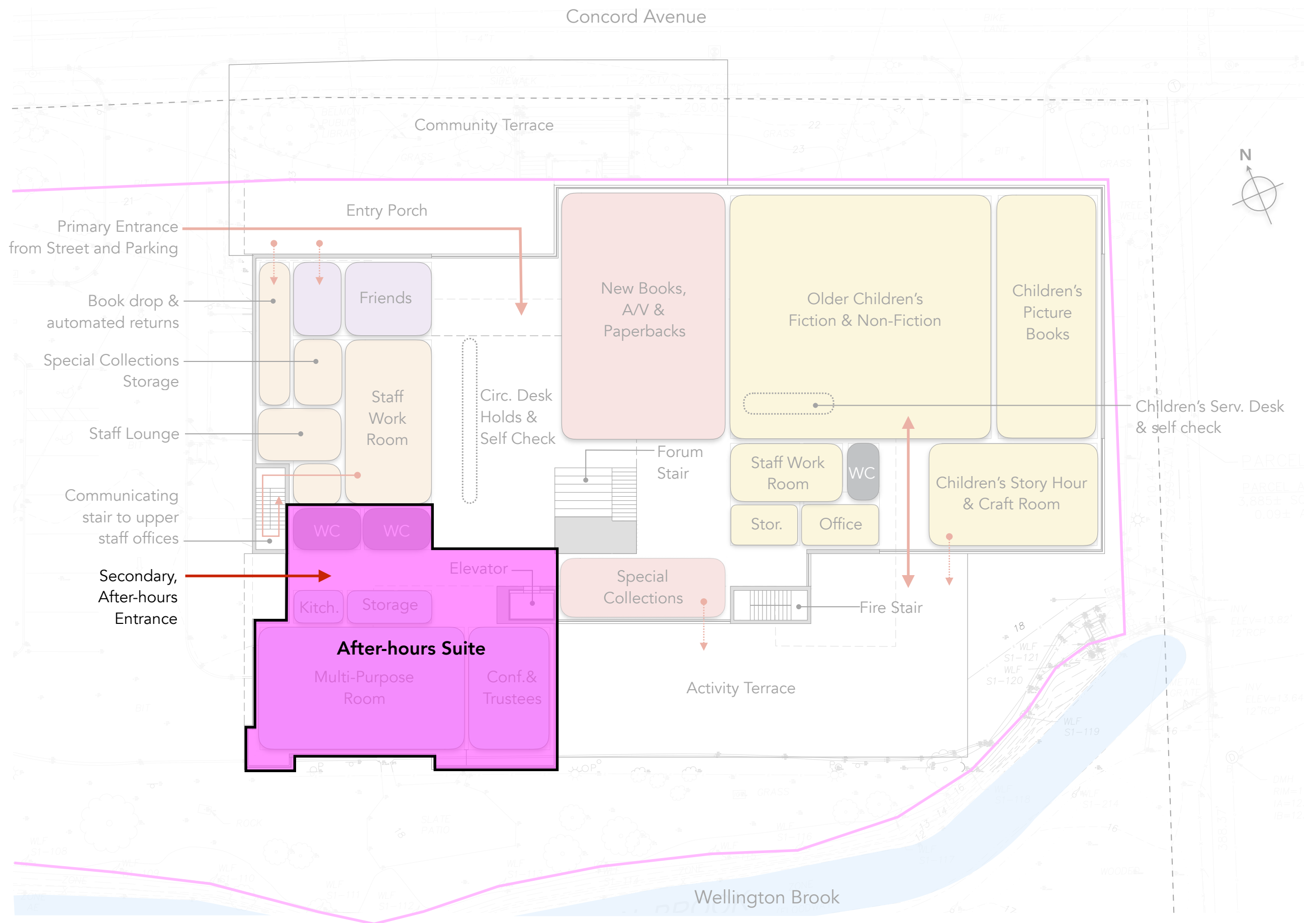


**OPTION 1 - First Floor Level**



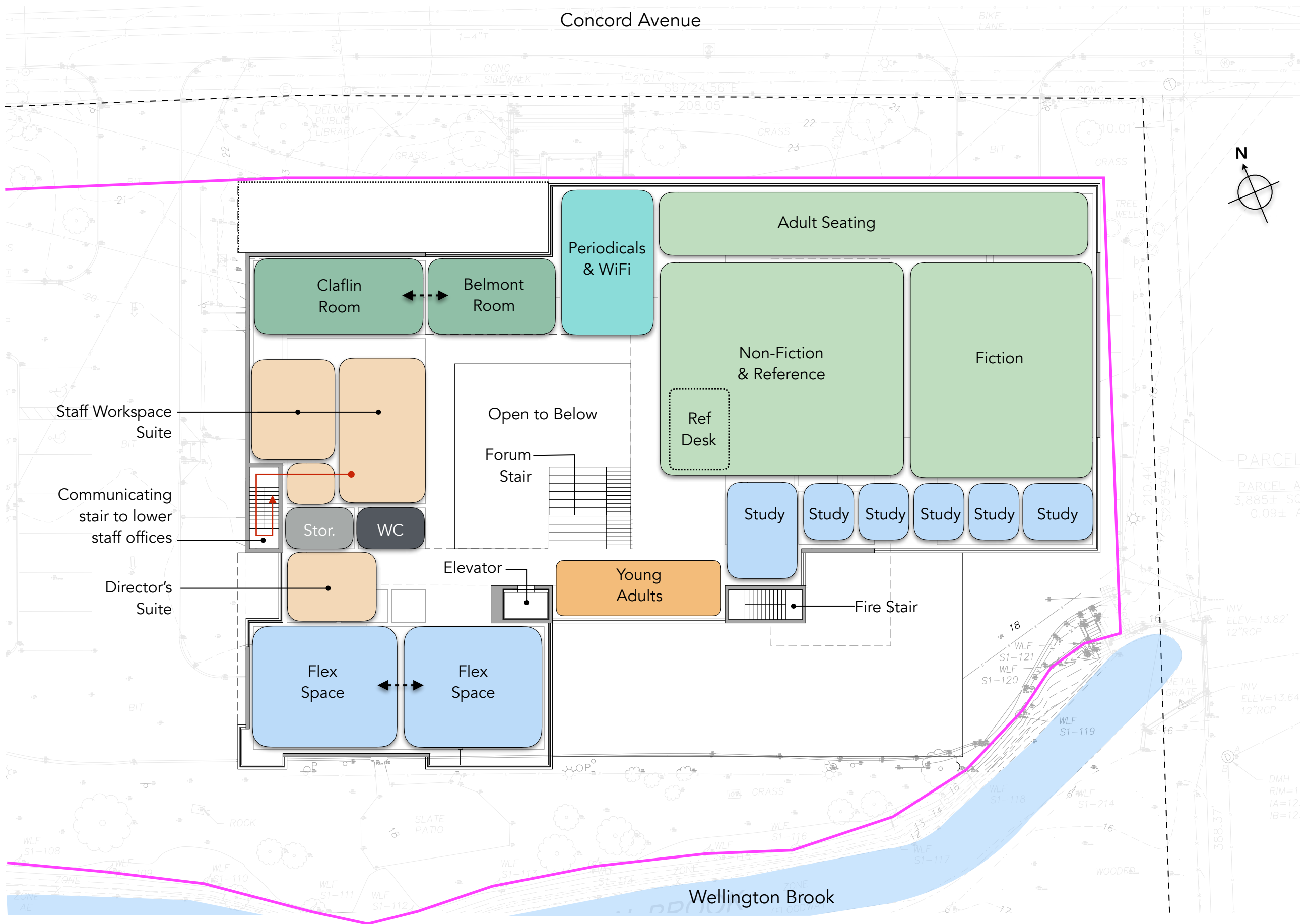


OPTION 1 - First Floor Level



**OPTION 1 - First Floor Level**

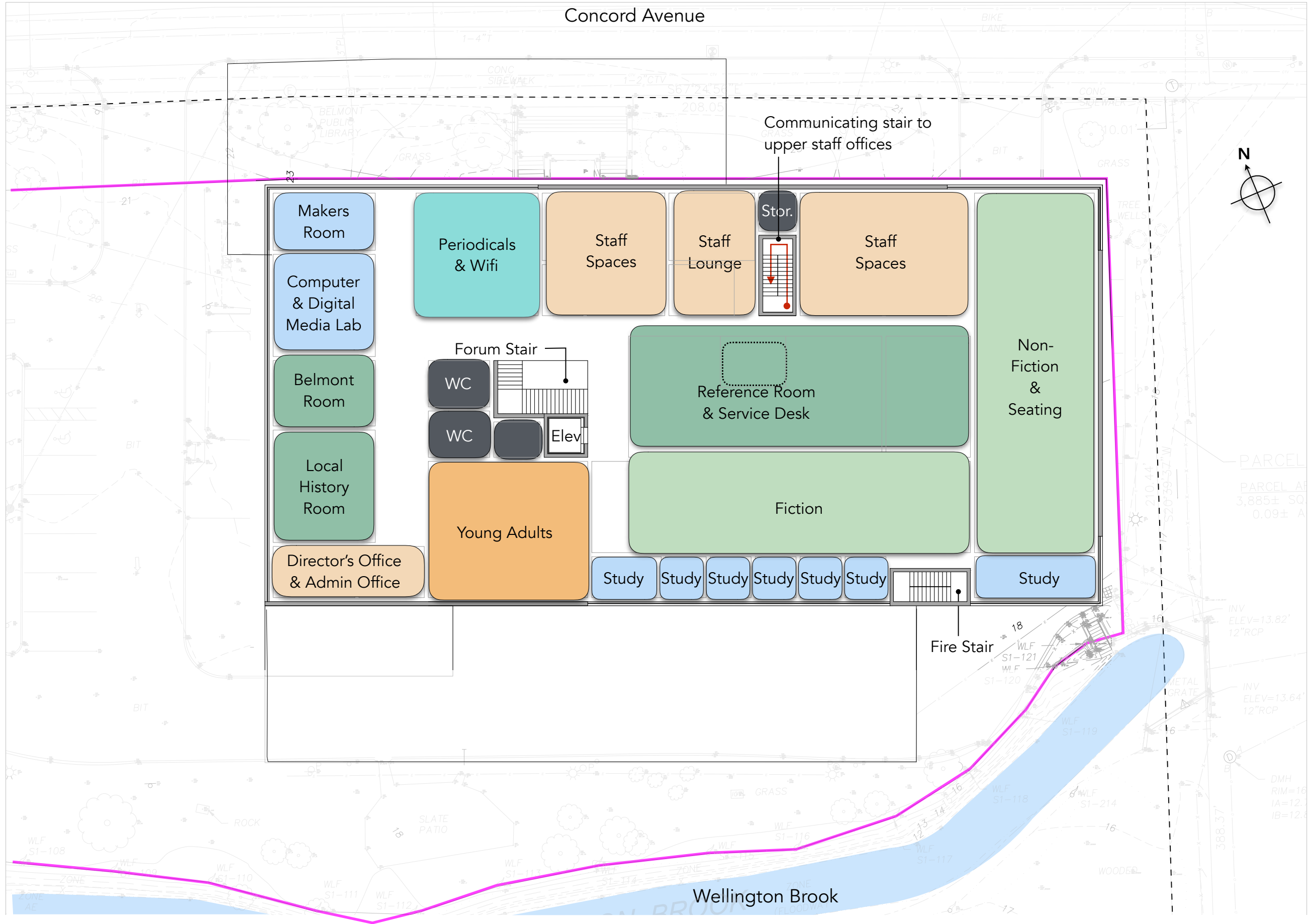




**OPTION 1 - Second Floor Level**







## OPTION 2 - First Floor Level



# Sustainable Design

An aerial photograph of a campus or industrial area, overlaid with a semi-transparent dark grey filter. The image shows a large, multi-story building with a complex roofline in the center. To the left of the building is a wide road with multiple lanes, filled with cars. To the right of the building is a large parking lot with many cars parked. In the background, there are more buildings and a large area of trees. The text "Sustainable Design" is written in a large, white, sans-serif font across the middle of the image.





# **Belmont Public Library**

# **Sustainable Design Goal Setting**

January 22, 2019



# The Green Engineer

Sustainable Design Consulting



**PROVEN**  
PROVIDER







# Chris Schaffner



Chris Schaffner  
President & Founder  
The Green Engineer, Inc.  
Certified B Corporation  
[Chris@greenengineer.com](mailto:Chris@greenengineer.com)

# Allison Zuchman



Allison Zuchman  
Senior Sustainability Consultant  
The Green Engineer, Inc.  
Certified B Corporation  
[Allison@greenengineer.com](mailto:Allison@greenengineer.com)



# Buildings Account for...

73% of electricity consumption

41% of energy use

38% of all carbon dioxide emissions

17% of potable water consumption

40% of raw materials use

30% of waste output





# Green Building Addresses...

Climate change

Resource depletion

Water consumption

Degradation of ecosystems/habitat

Indoor environmental quality

Occupant health, comfort and  
productivity

Costs of owning and operating



# What is a GREEN BUILDING?



# TRIPLE BOTTOM LINE

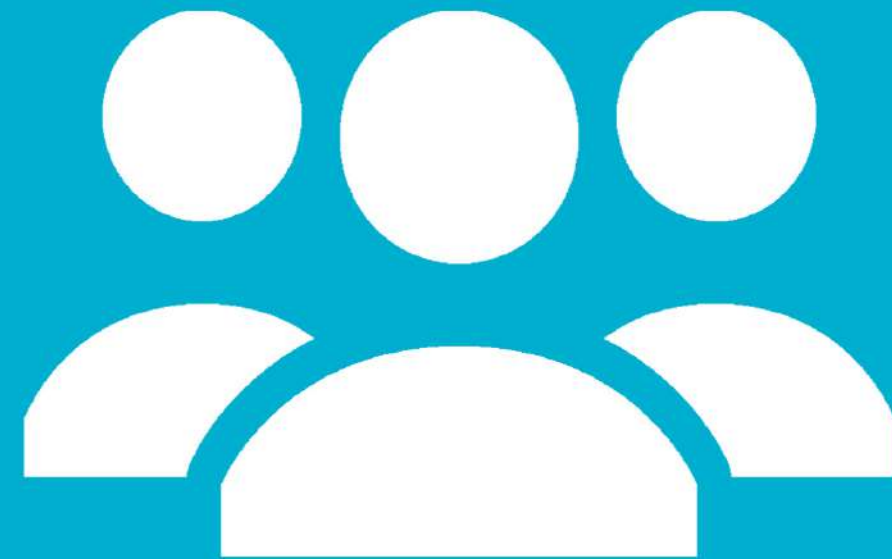
ENVIRONMENTAL  
STEWARDSHIP



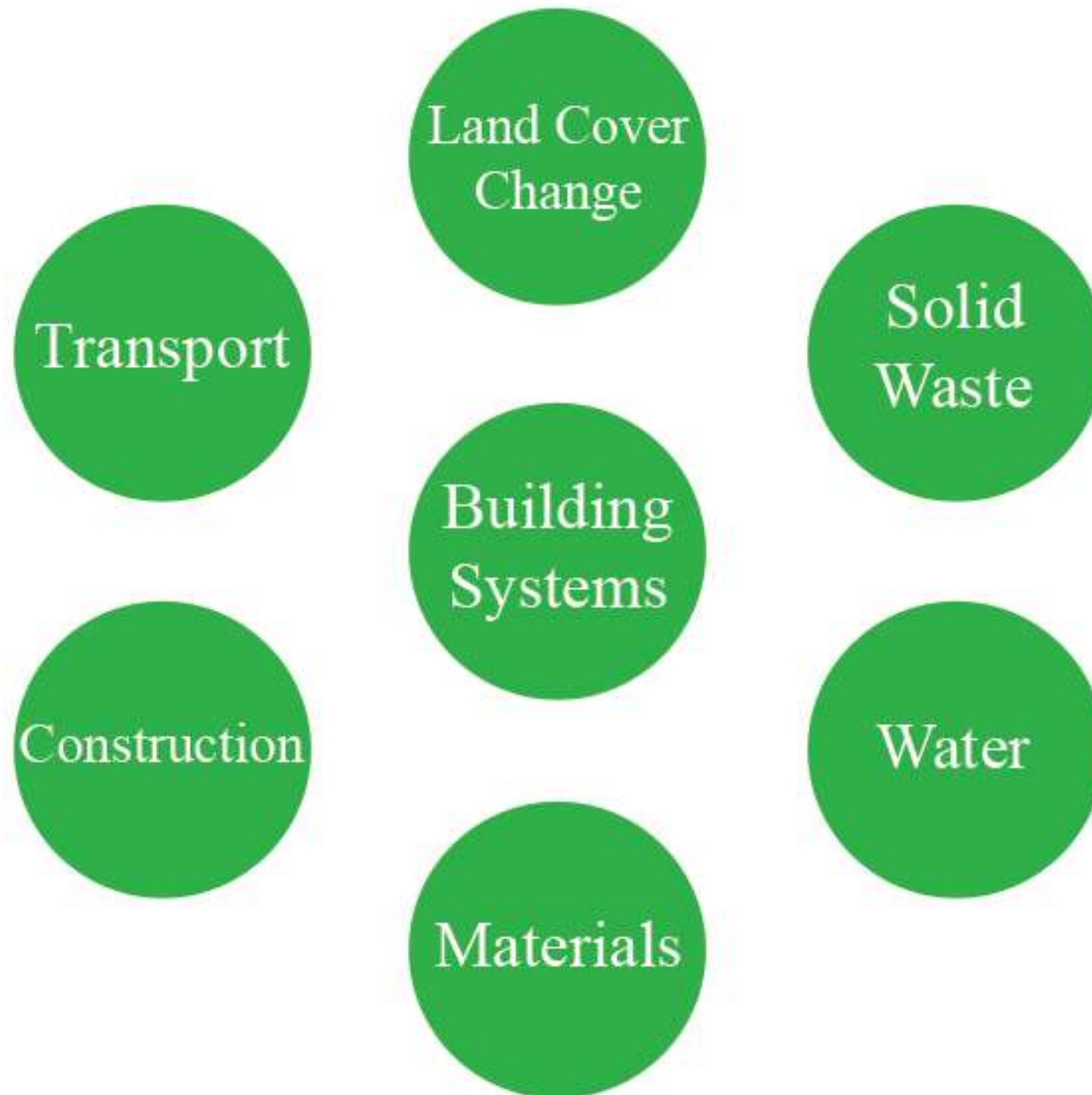
ECONOMIC  
PROSPERITY



SOCIAL  
RESPONSIBILITY

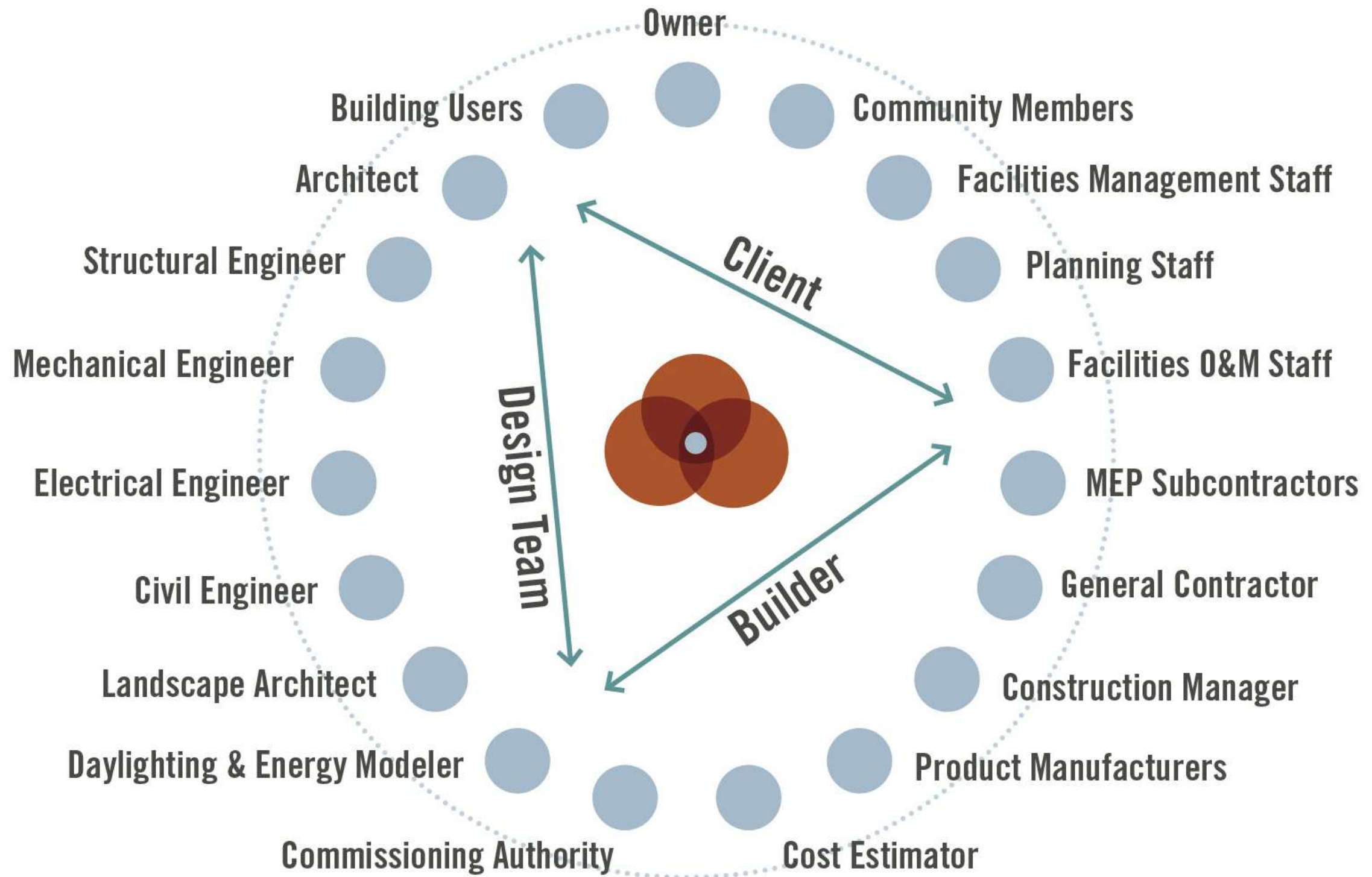


# Elements of Carbon Footprint





# Integrative Approach: Key Stakeholders



Reduced  
operating &  
maintenance  
costs

Better indoor  
air quality

Learning  
opportunities

Improved  
occupant  
performance

## Integrative Approach: Benefits

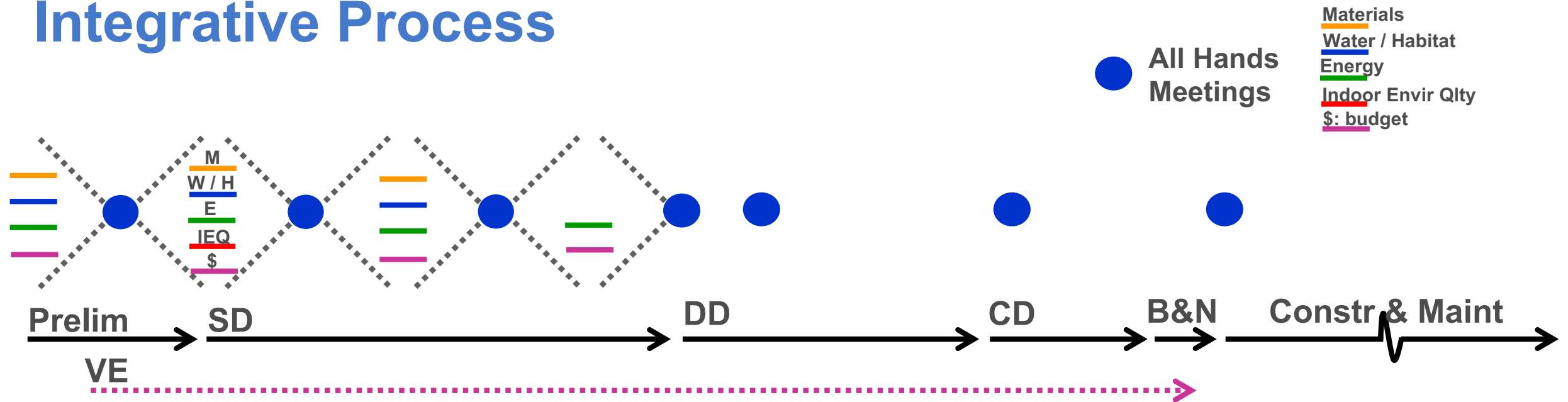
Reduced  
environmental  
impacts

Durable  
facilities

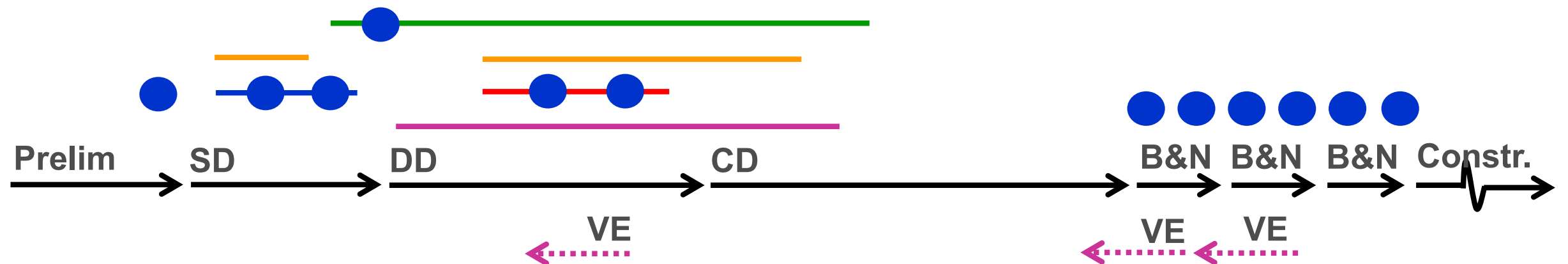
Potentially  
no increase in  
construction  
cost

Optimized  
return on  
investment

# Integrative Process

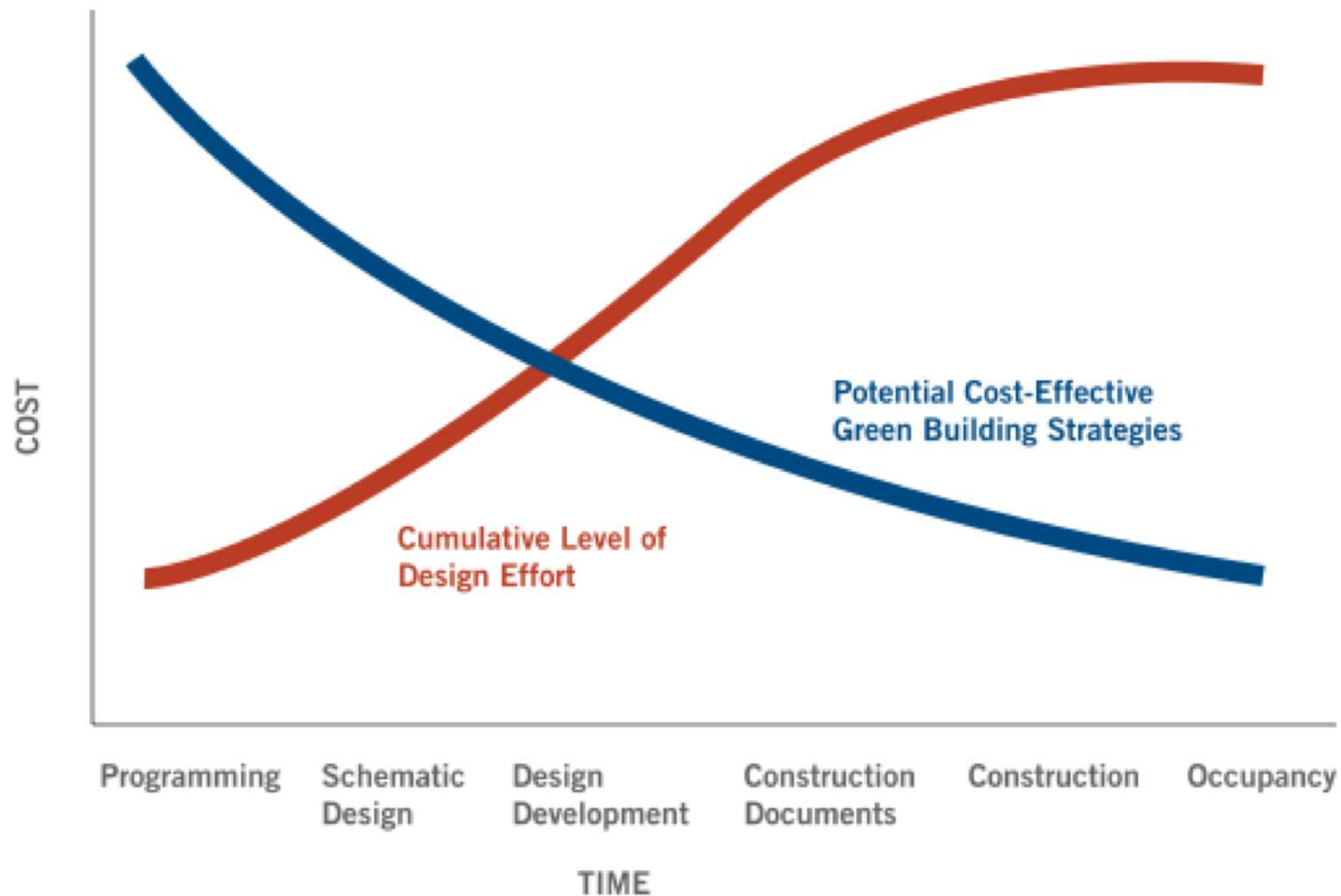


# Linear Design Process





# Ecological design saving opportunities





# Leadership in Energy and Environmental Design

A leading-edge system  
for certifying the  
greenest performing  
buildings in the world

**LEED® Facts**  
[Your Project Here]  
[City, State, County]

LEED for New Construction

**Platinum**

Sustainable Sites	26
Water Efficiency	10
Energy & Atmosphere	35
Materials & Resources	14
Indoor Environmental Quality	15

\*Out of a possible 100 points + 10 bonus points

Innovation & Design	6
Regional Credit	4

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# LEEDv4 SYSTEM GOALS

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Reduce contribution to **global climate change**



Enhance individual **human health**



Protect and restore **water resources**



Protect and enhance **biodiversity and ecosystem services**



Promote **sustainable and regenerative** material cycles



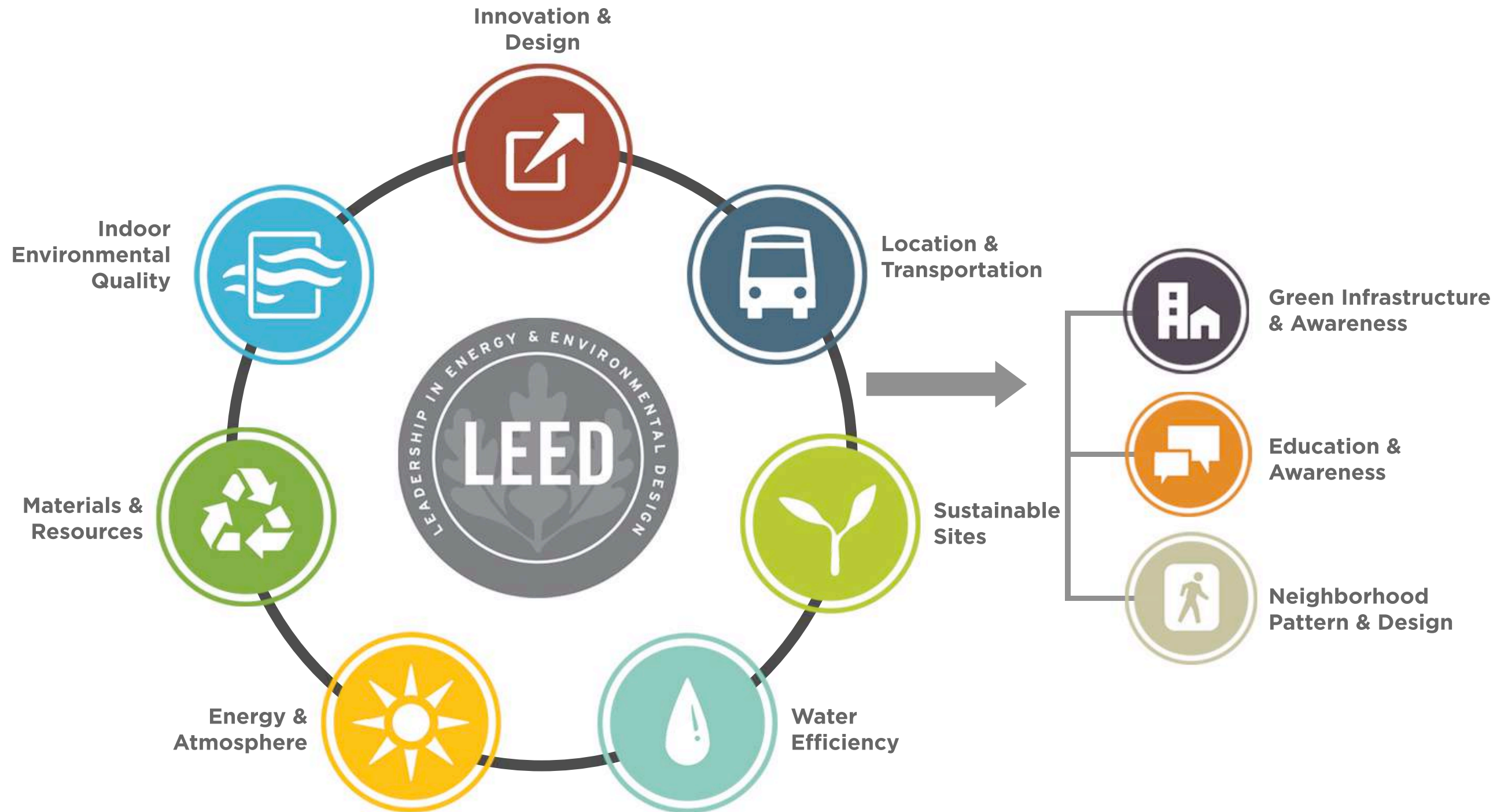
Build a **green economy**



Enhance **community quality of life**



# Organization of LEED



# THE WELL BUILDING STANDARD



Klepeis NE, Nelson WC, Ott WR, et al. The National Human Activity Pattern Survey (NHAPS): a resource for assessing exposure to environmental pollutants. *Journal of exposure analysis and environmental epidemiology*. 2001;11(3):231-252.

WE SPEND  
ABOUT **90%**  
OF OUR TIME  
INDOORS



# A COMPREHENSIVE APPROACH TO WELL-BEING



AIR

14 FEATURES  
4 preconditions  
10 optimizations



WATER

8 FEATURES  
3 preconditions  
5 optimizations



NOURISHMENT

13 FEATURES  
2 preconditions  
11 optimizations



LIGHT

8 FEATURES  
2 preconditions  
6 optimizations



MOVEMENT

12 FEATURES  
2 preconditions  
10 optimizations



THERMAL  
COMFORT

7 FEATURES  
1 precondition  
6 optimizations



SOUND

5 FEATURES  
1 precondition  
4 optimizations



MATERIALS

14 FEATURES  
3 preconditions  
11 optimizations



MIND

15 FEATURES  
2 preconditions  
13 optimizations



COMMUNITY

16 FEATURES  
3 preconditions  
13 optimizations



## Getting to Zero

**Final Report of the Massachusetts  
Zero Net Energy Buildings Task Force**

March 11, 2009

## MA Definition

“A zero net energy building is one that is optimally efficient and, over the course of a year, generates energy onsite, using clean renewable resources, in a quantity equal to or greater than the total amount of energy consumed onsite.”



# Health Impact Categories



has a vision for a healthier future where **every building** is enhanced to support the wellbeing of its occupants, and support healthy communities



IMPACTS  
COMMUNITY  
HEALTH



REDUCES  
MORBIDITY +  
ABSENTEEISM



INSTILLS  
FEELINGS OF  
WELLBEING



SOCIAL EQUITY FOR  
VULNERABLE  
POPULATIONS



PROVIDES  
HEALTHY FOOD  
OPTIONS



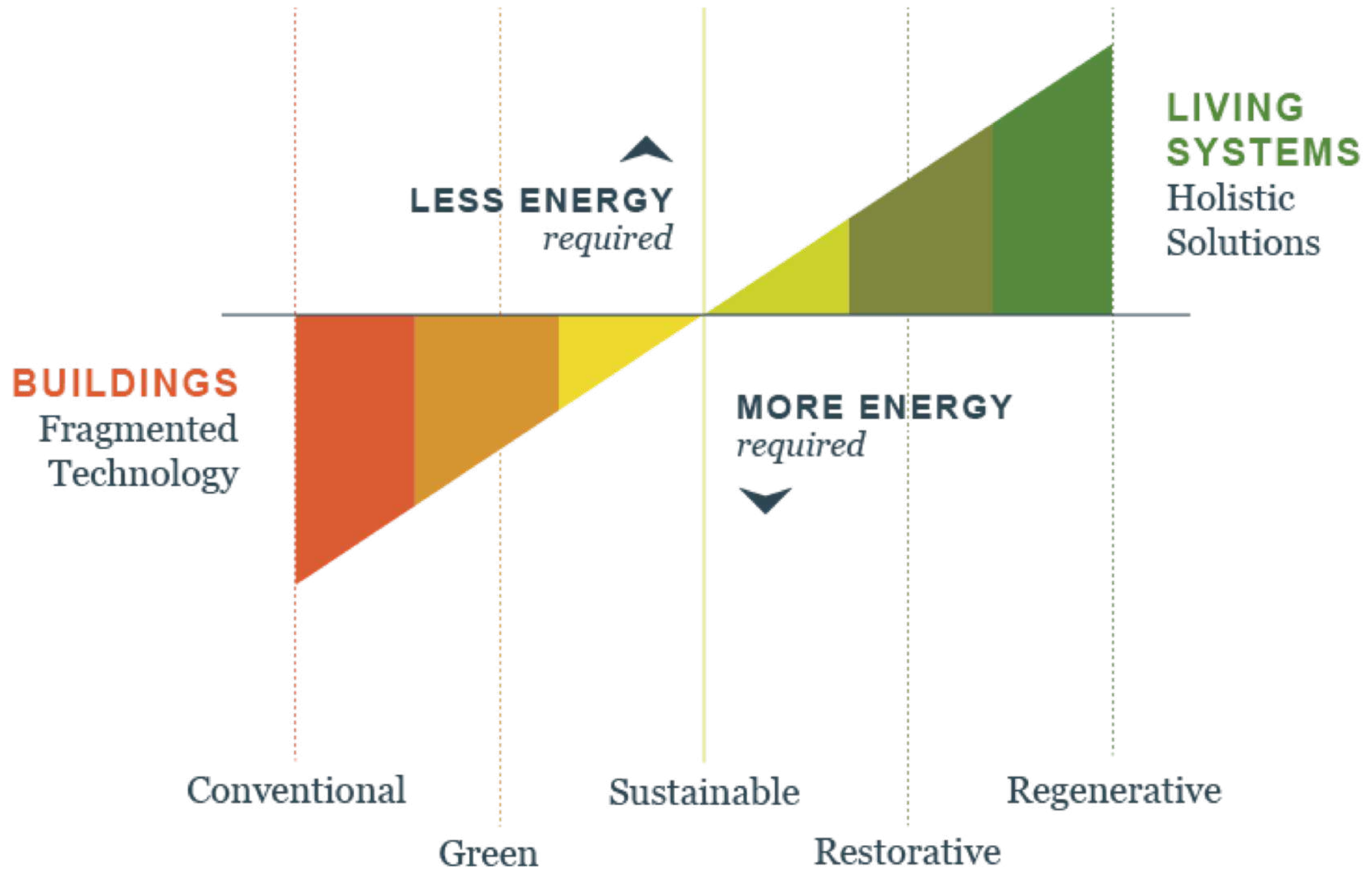
PROMOTES  
OCCUPANT  
SAFETY




INCREASES  
PHYSICAL  
ACTIVITY



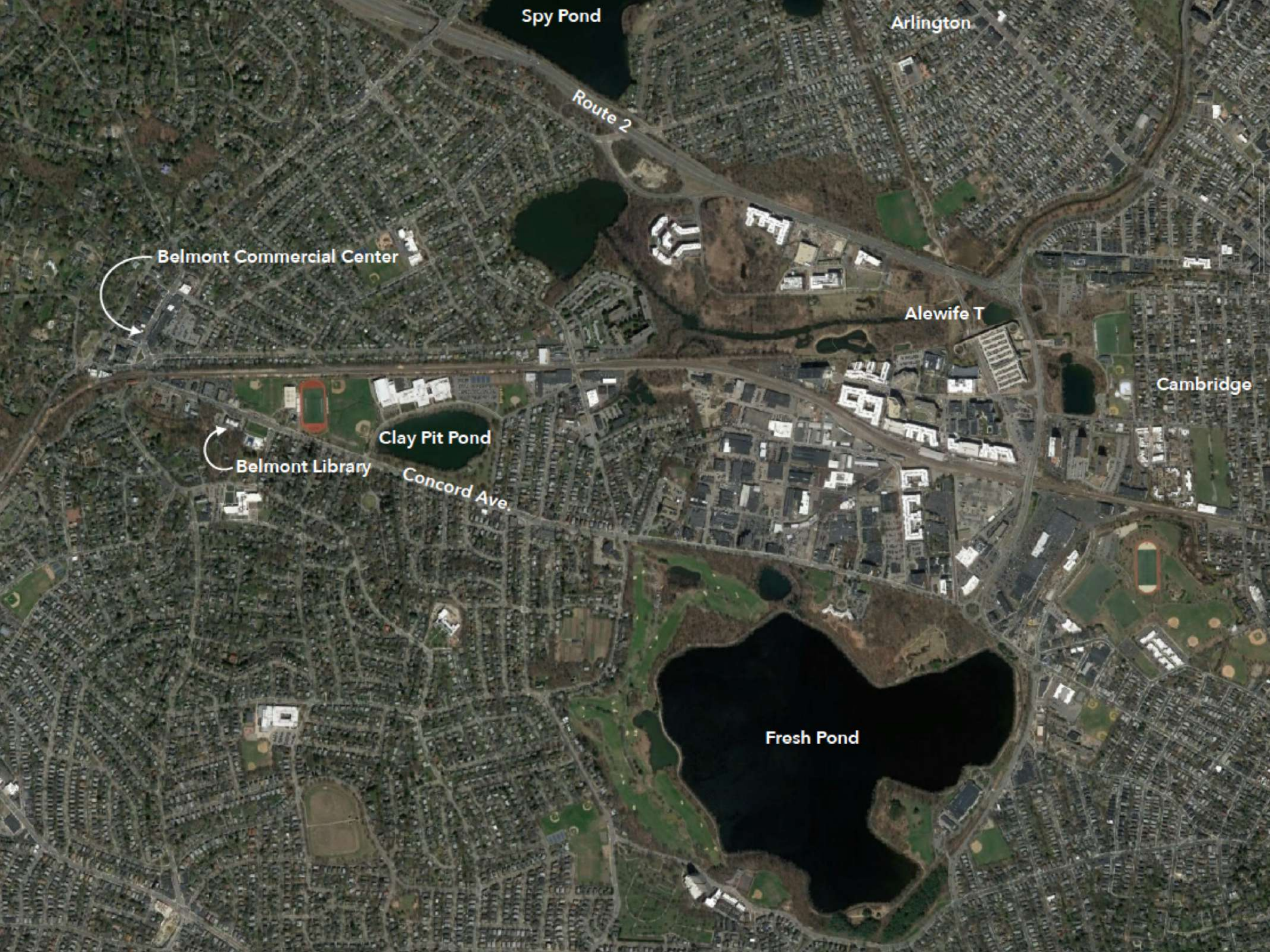
# Trajectory of Sustainable Design



[Image: Ecotrust, The Bullitt Center]

	LIVING BUILDING CHALLENGE 3.1			
	BUILDINGS	RENOVATIONS	LANDSCAPE + INFRASTRUCTURE	
PLACE				01. LIMITS TO GROWTH
	SCALE JUMPING		SCALE JUMPING	02. URBAN AGRICULTURE
			SCALE JUMPING	03. HABITAT EXCHANGE
				04. HUMAN-POWERED LIVING
WATER			SCALE JUMPING	05. NET POSITIVE WATER
ENERGY			SCALE JUMPING	06. NET POSITIVE ENERGY
HEALTH + HAPPINESS				07. CIVILIZED ENVIRONMENT
				08. HEALTHY INTERIOR ENVIRONMENT
				09. BIOPHILIC ENVIRONMENT
MATERIALS				10. RED LIST
			SCALE JUMPING	11. EMBODIED CARBON FOOTPRINT
				12. RESPONSIBLE INDUSTRY
				13. LIVING ECONOMY SOURCING
				14. NET POSITIVE WASTE
				15. HUMAN SCALE + HUMANE PLACES
EQUITY				16. UNIVERSAL ACCESS TO NATURE + PLACE
			SCALE JUMPING	17. EQUITABLE INVESTMENT
				18. JUST ORGANIZATIONS
				19. BEAUTY + SPIRIT
BEAUTY				20. INSPIRATION + EDUCATION





Spy Pond

Arlington

Route 2

Belmont Commercial Center

Alewife T

Cambridge

Clay Pit Pond

Belmont Library

Concord Ave.

Fresh Pond

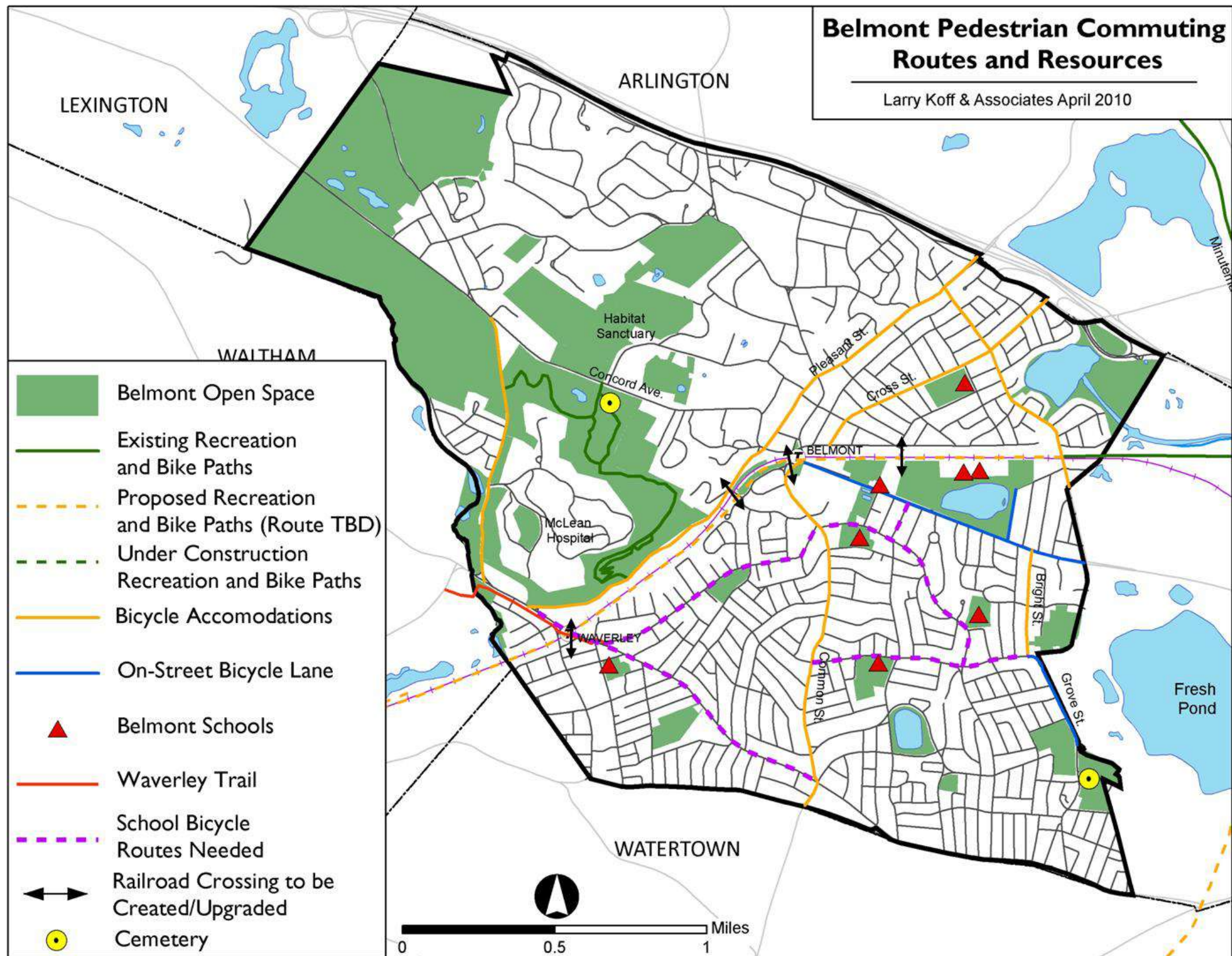


# Belmont Comprehensive Plan (2010-2020)

## Transportation and Energy Strategies

### Keep Belmont a Walkable Community

- Bikeways should be connected to schools, transit stations, villages and public amenities.
- Reduce Auto Dependency
- Promote Car-sharing and ridesharing programs.
- Create a Town-wide Parking Management Plan.
- Reduce solid waste collection.
- Reduce electricity use.
- Encourage decentralized energy production.
- Integrate energy conservation into public school curriculum.
- Reduce energy use in municipal buildings and facilities.



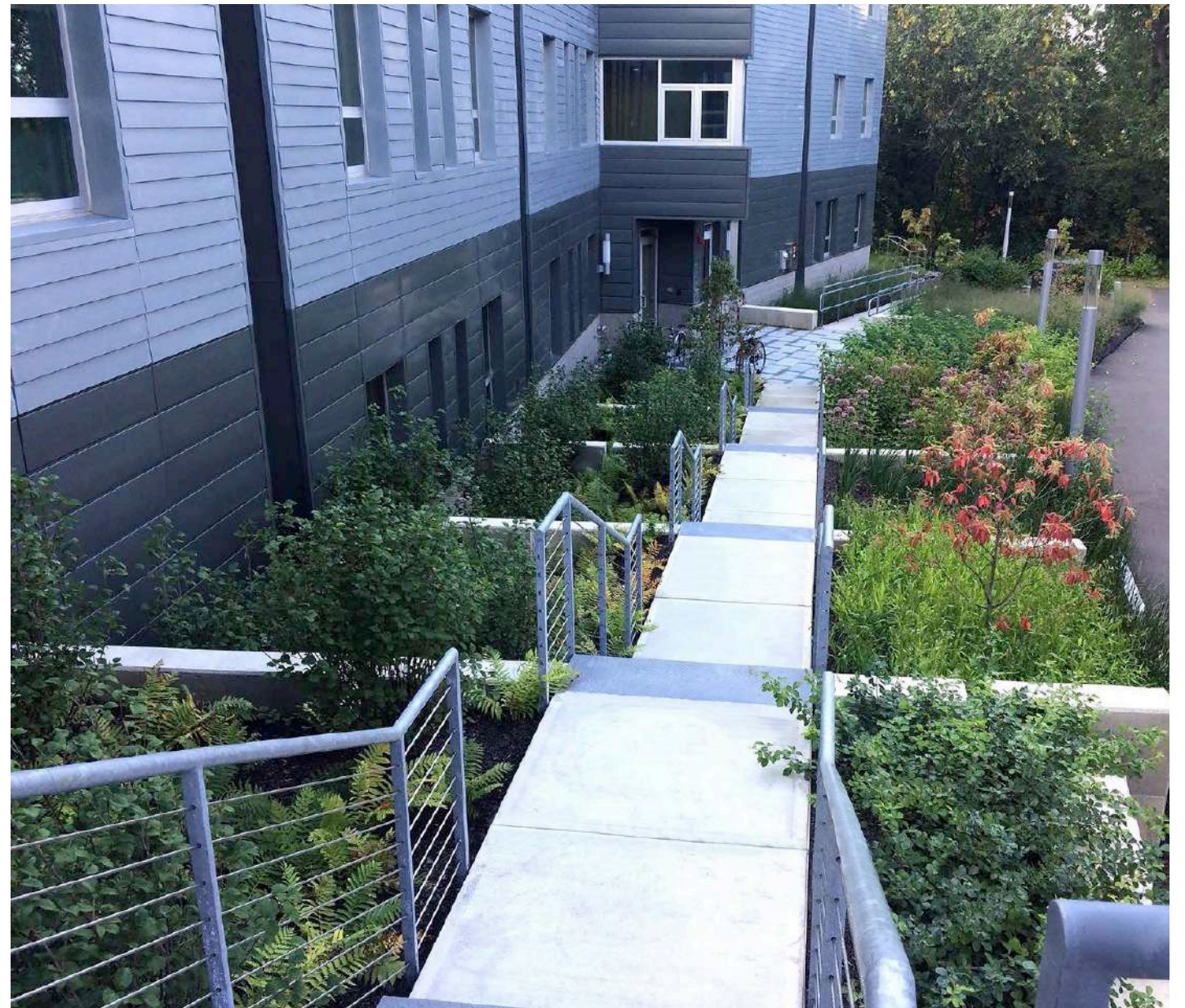


# Water Management





# Water Management







Wildflower Garden

Central  
Rain Garden

Outdoor  
Classroom

Wellington Brook

Underwood  
Pool

Green Terrace

Community  
Terrace

Concord Avenue

Underwood Lawn



# Project Goal Setting: Exercise 1

What would you want the Belmont Citizen-Herald to say about this project when the new Belmont Library is complete and occupied? After being opened for five years, what do you want people to still be saying about it?

# Project Goal Setting: Exercise 2

What is unique about this location and program that could contribute to the sustainable design features of project?

What is unique about the project that could contribute to the sustainable development of the neighborhood / Town / greater Boston?





The Green Engineer  
Sustainable Design Consulting

**Thank you.**



Oudens Ello Architecture