Inclusive Design and Building Performance

Exploring Synergies with Equity, Sustainability, and Health

Panelists

Peter A. Stratton
Managing Director, Accessibility Services
Steven Winter Associates, Inc.

Katie Osborn
Principal and Founder, ViaCollective, Inc.

Ethan Lu, AIA
Acting Assistant Chair & Assistant Professor of Interior Design
Fashion Institute of Technology / SUNY

Victoria Lanteigne, WELL AP
Consultant and PhD Student
North Carolina State University

Agenda

- Inclusive Design and Building Performance (10 min)
- Panelist Presentations (30 min)
- Moderated Discussion (30 min)
- Q&A (20 min)

Why Inclusive Design?

Accessible design

Universal design

Inclusive design

Why Inclusive Design?

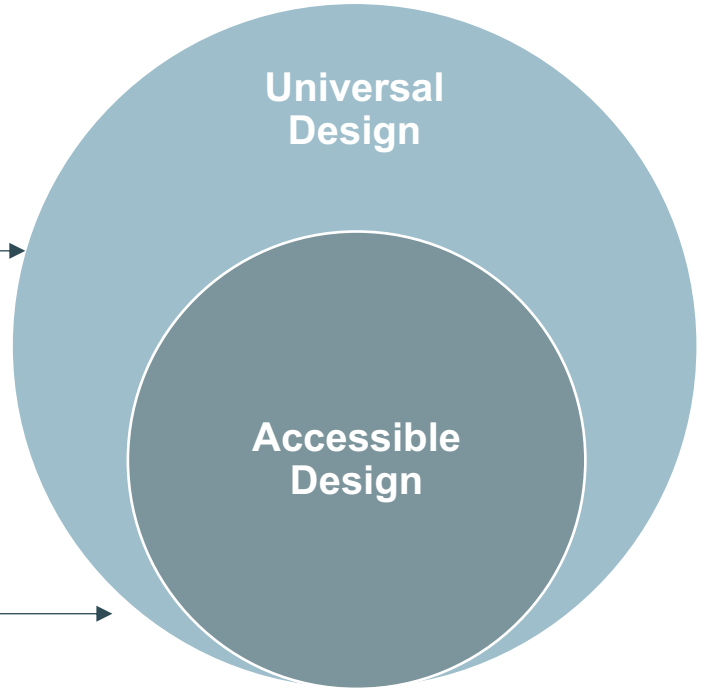
Compliance-based approach → Accessible Design

(Story et al., 1998)

Why Inclusive Design?

Accommodates as many users as possible

Compliance-based approach



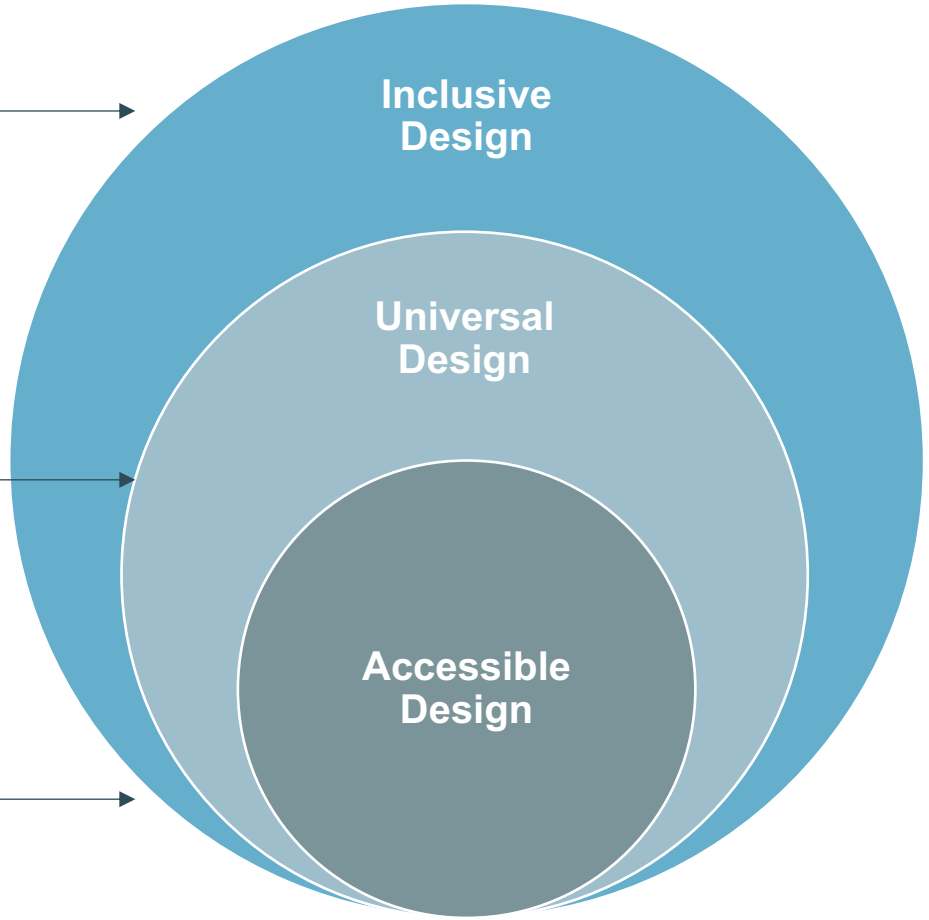
(Steinfeld and Maisel, 2012)

Why Inclusive Design?

Addresses a broader range of individual and intersectional identities

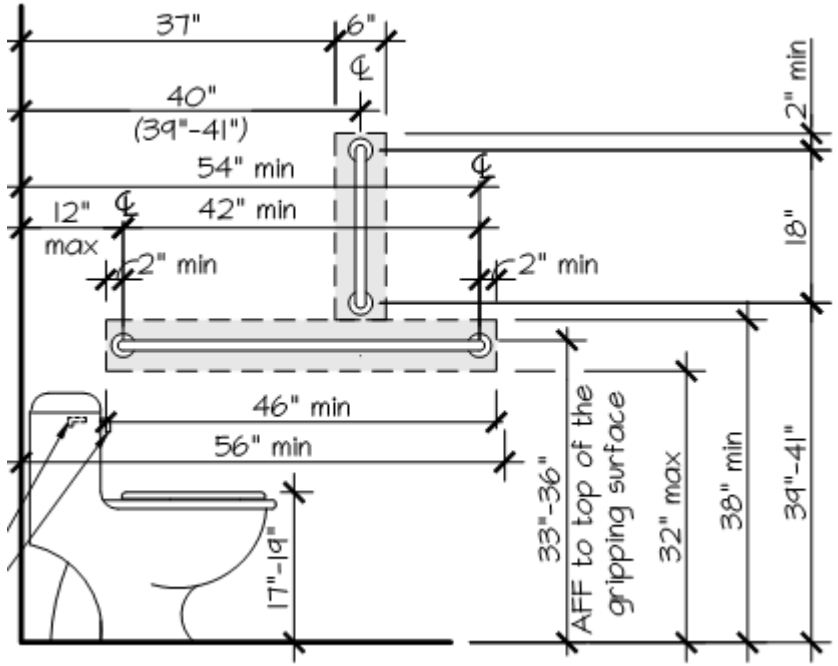
Accommodates as many users as possible

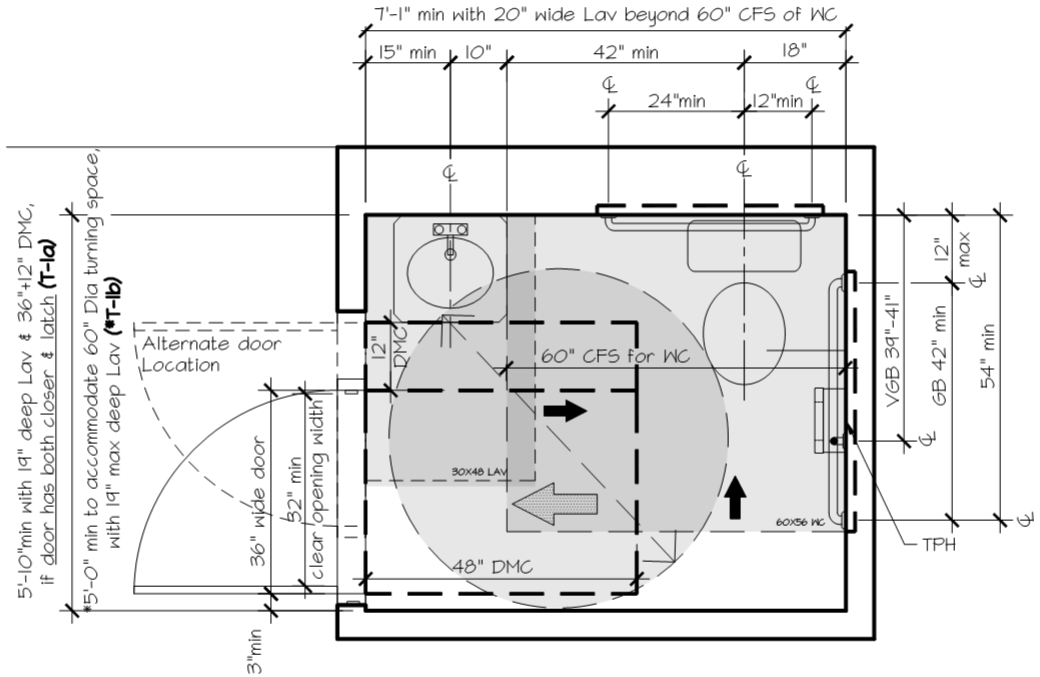
Compliance-based approach



(Coleman, 1994; Costanza Chock, 2020)

Accessible Design





Universal Design

Inclusive Design

Inclusive Design and Building Performance

(Enertiv, 2020)

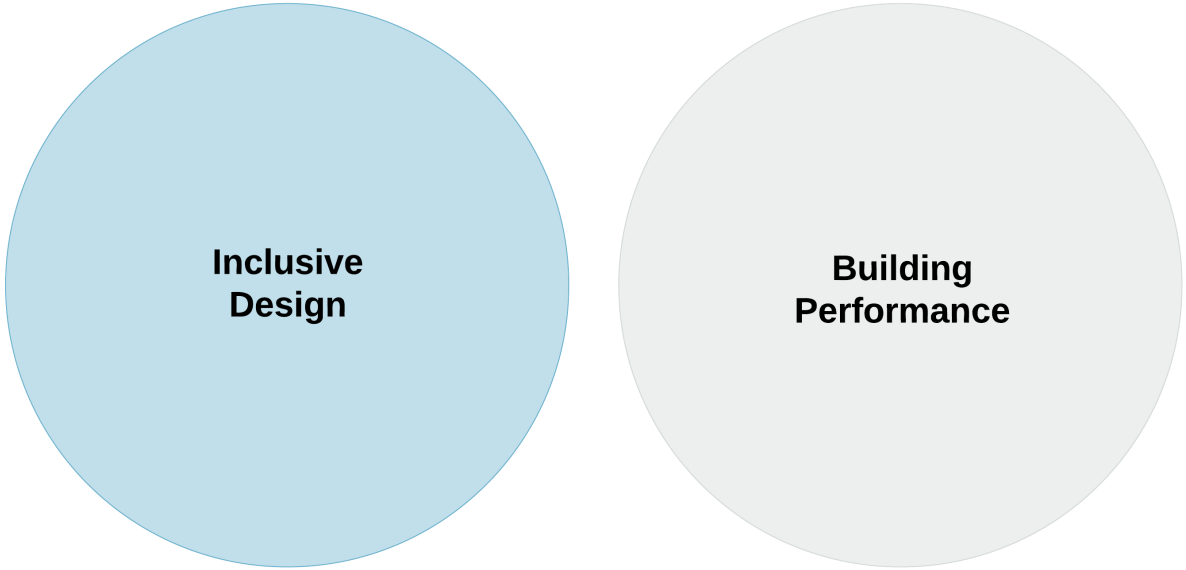
Inclusive Design and Building Performance

Building Performance is a data-driven approach to understanding how a building functions, typically across energy usage and other facets of day-to-day operations.

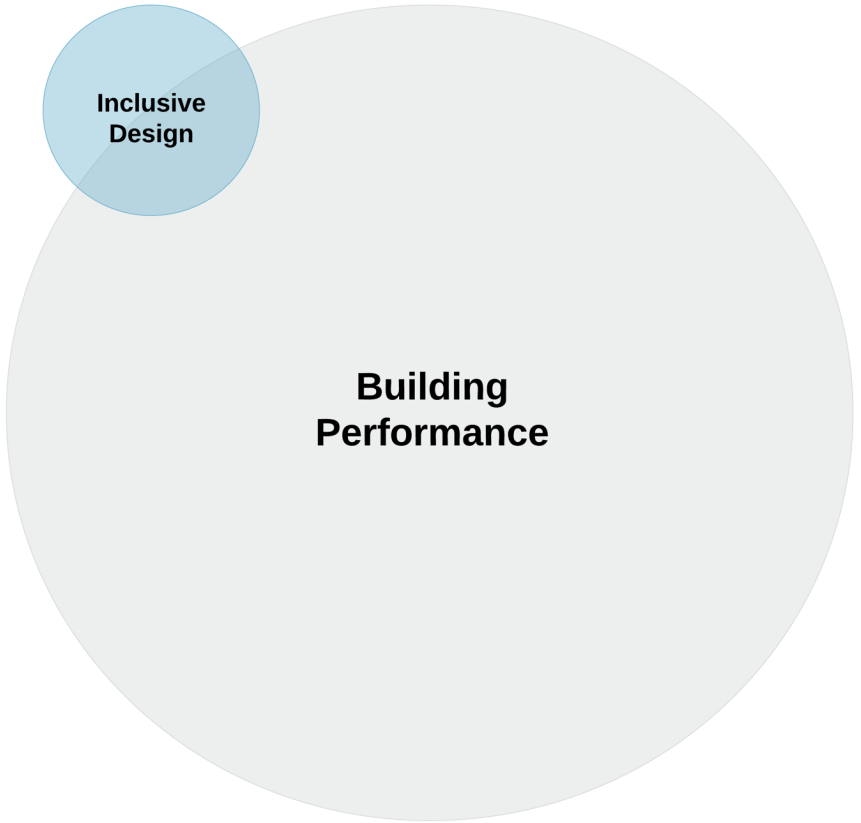
(Enertiv, 2020)

Inclusive Design and Building Performance

Building Performance is a data-driven approach to understanding how a building functions, typically across energy usage and other facets of day-to-day operations.



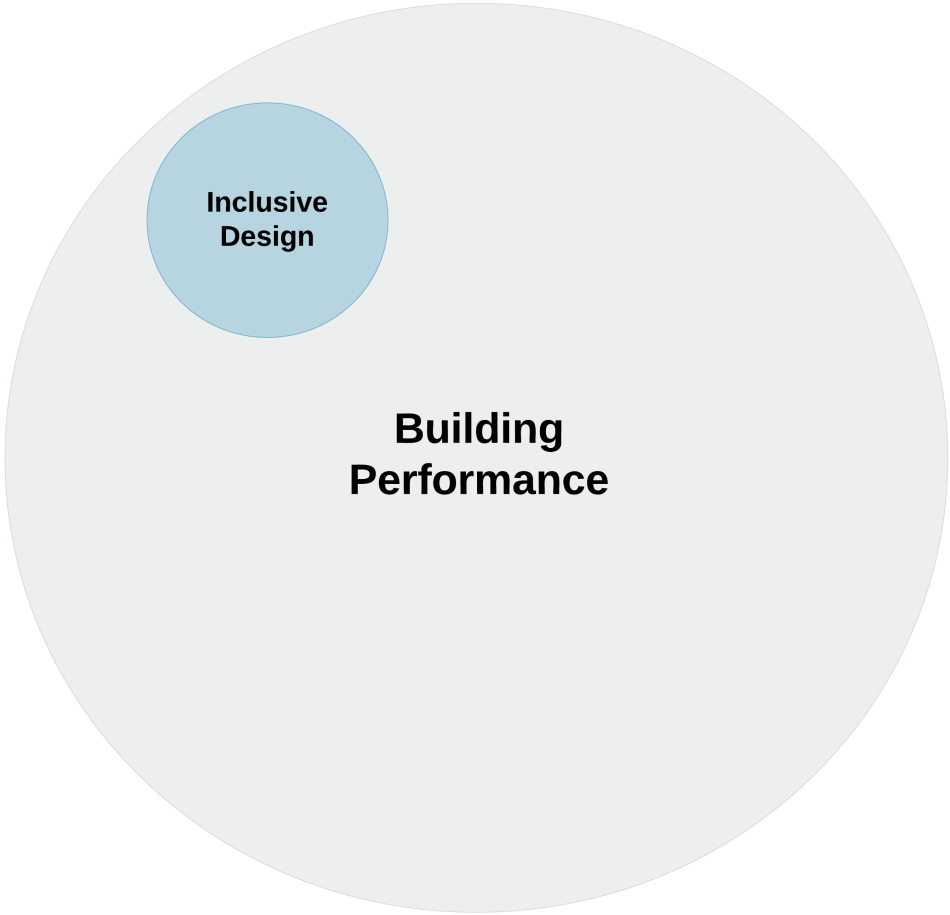
Inclusive Design and Building Performance



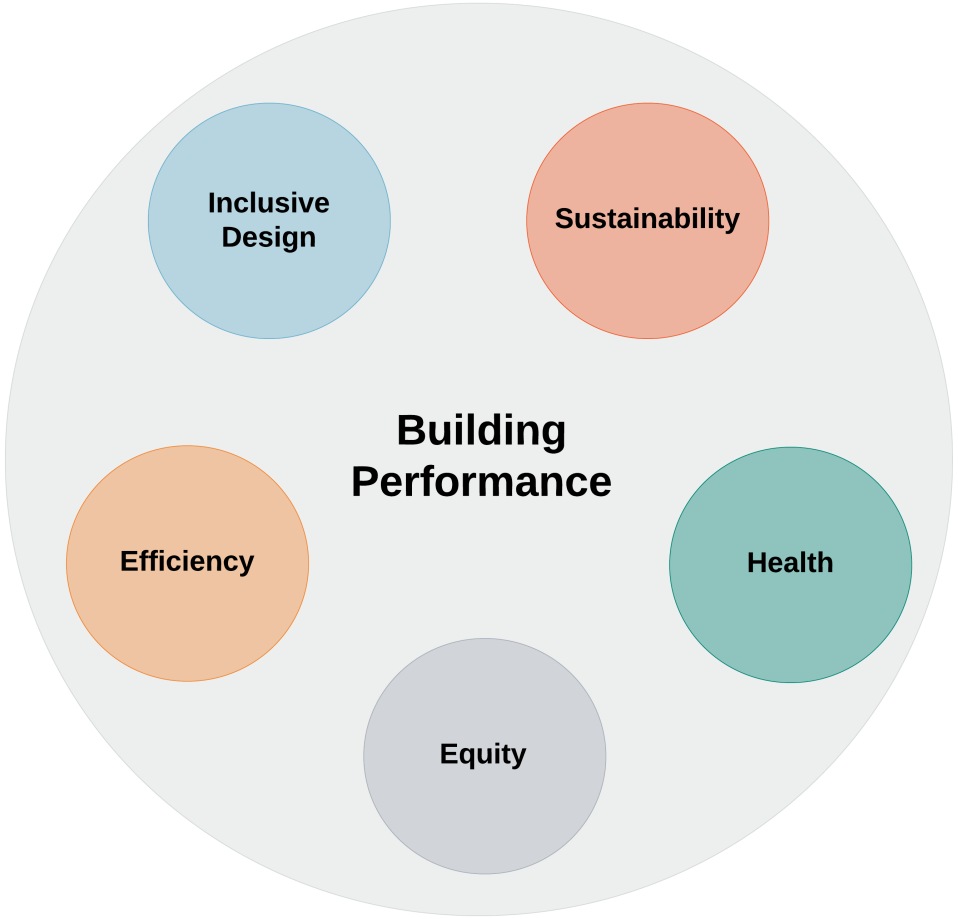
Inclusive Design and Building Performance

Building Performance Standard	Universal/Inclusive Design Standard	Pathway Options/ Requirements
WELL v2 **SWA Contributing Author*	Feature C13: Accessibility and Universal Design	Optional (optimization) feature worth 2 points towards WELL Certification.
LEED v4 **SWA Contributing Author*	Inclusive Design Pilot Credit	Optional credit worth 1 point towards LEED certification.
Enterprise Green Communities	7.12. Beyond ADA: Universal Design	Optional pathway worth up to 8 points towards certification.
Living Building Challenge	Equity Petal: Core Imperative 17 - Universal Access	Required to achieve Equity Petal Certification.

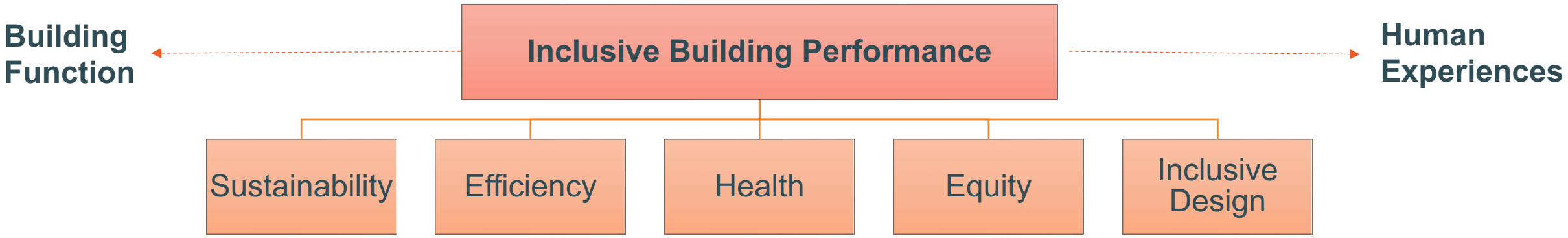
Inclusive Design and Building Performance



Inclusive Design and Building Performance



Inclusive Building Performance



Inclusive Building Performance

- Centralized Inclusive Design guidance

Discussion Questions

- Why have practitioners been slow to adopt Inclusive Design; what circumstances might spark adoption rates?
- What are the biggest barriers facing adoption rates of newer iterations of Inclusive Design?
- How are practitioners and thought leaders implementing or informing new iterations of Inclusive Design?
- What will signify that Inclusive Design has fully evolved as a strategy for Building Performance?

Inclusive Design & Wayfinding

June 29, 2022

Building Energy Exchange

1. Wayfinding Sytems
2. Designing for the Visitor
3. Projects that Are (or Aren’t) Inclusive
4. New & Expanding Opportunities

WAYFINDING & SIGNAGE

WAYFINDING ≠ SIGNAGE

WAYFINDING

=

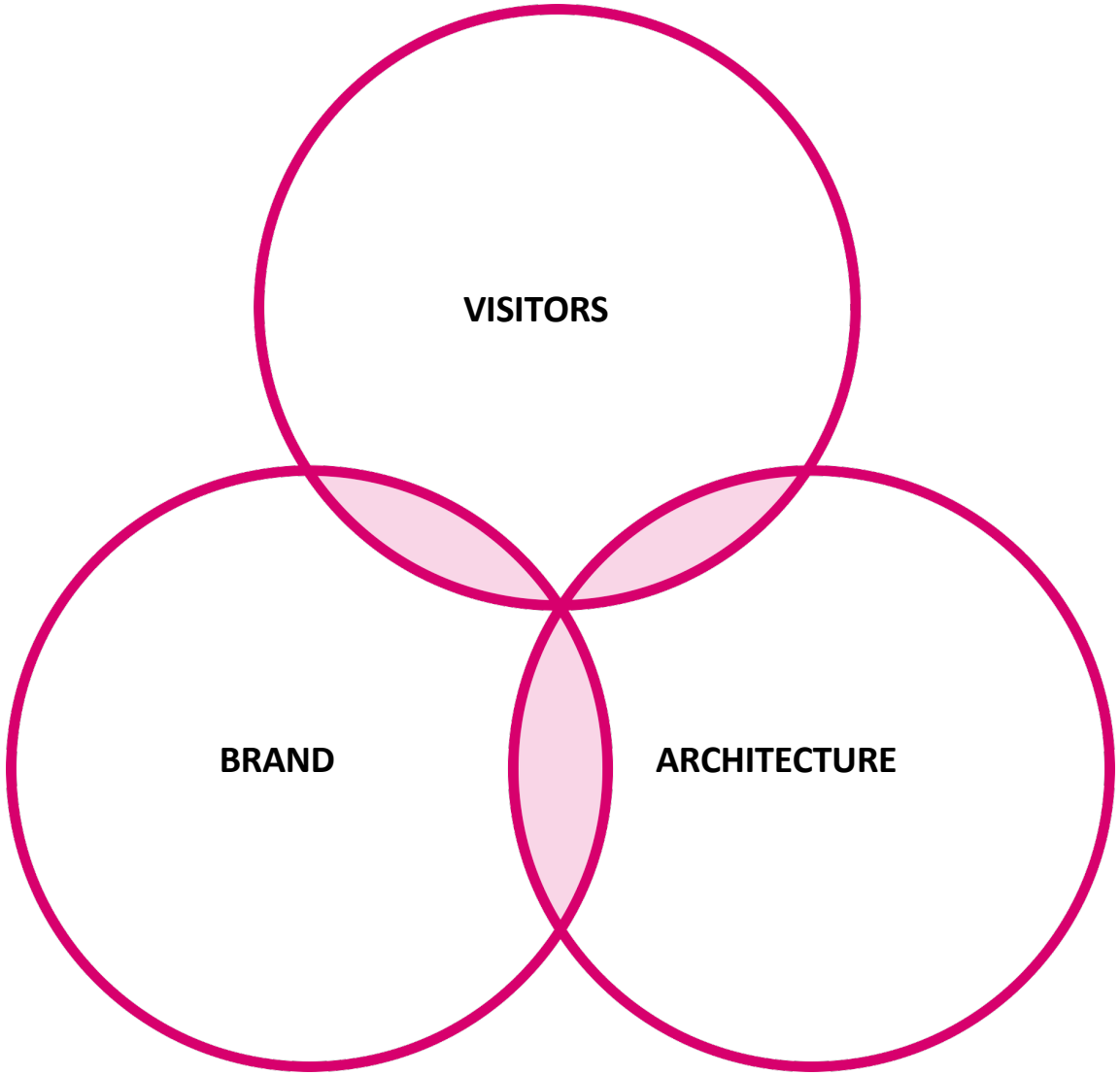
STRATEGY OF NAVIGATING PEOPLE THROUGH A PHYSICAL SPACE

WAYFINDING ≠ SIGNAGE

SIGNAGE

=

ONE OF MANY WAYFINDING TOOLS THAT HELP PEOPLE NAVIGATE


VISITORS
BRAND
ARCHITECTURE

VISITORS

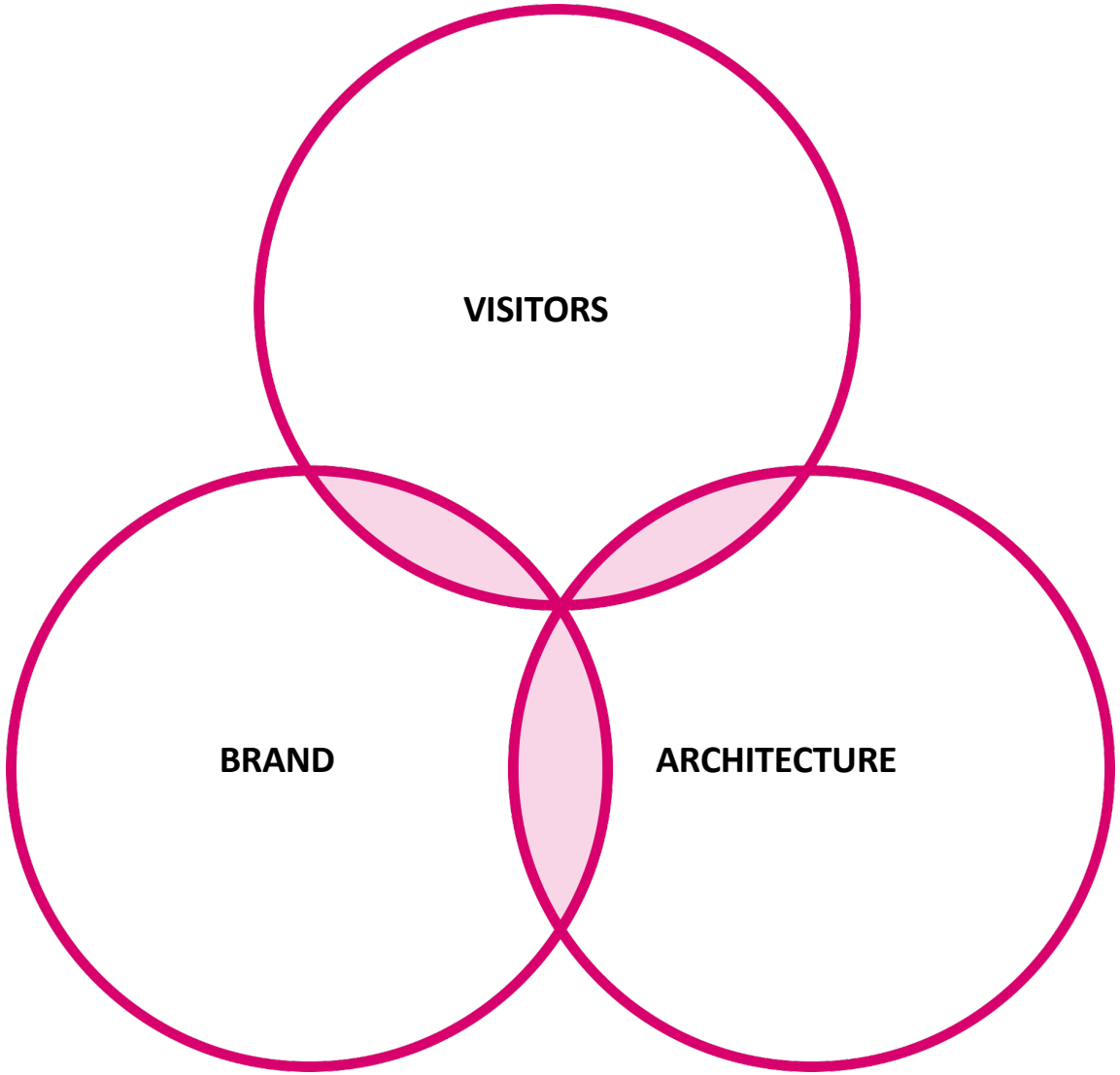
- People are the ‘client’
- Wayfinding begins before they arrive
- Pre-arrival interactions include websites, mobile apps, mail, customer service or email
- Static maps are still essential
- Architecture and branding will be the first thing that greet people as they approach the destination

ARCHITECTURE

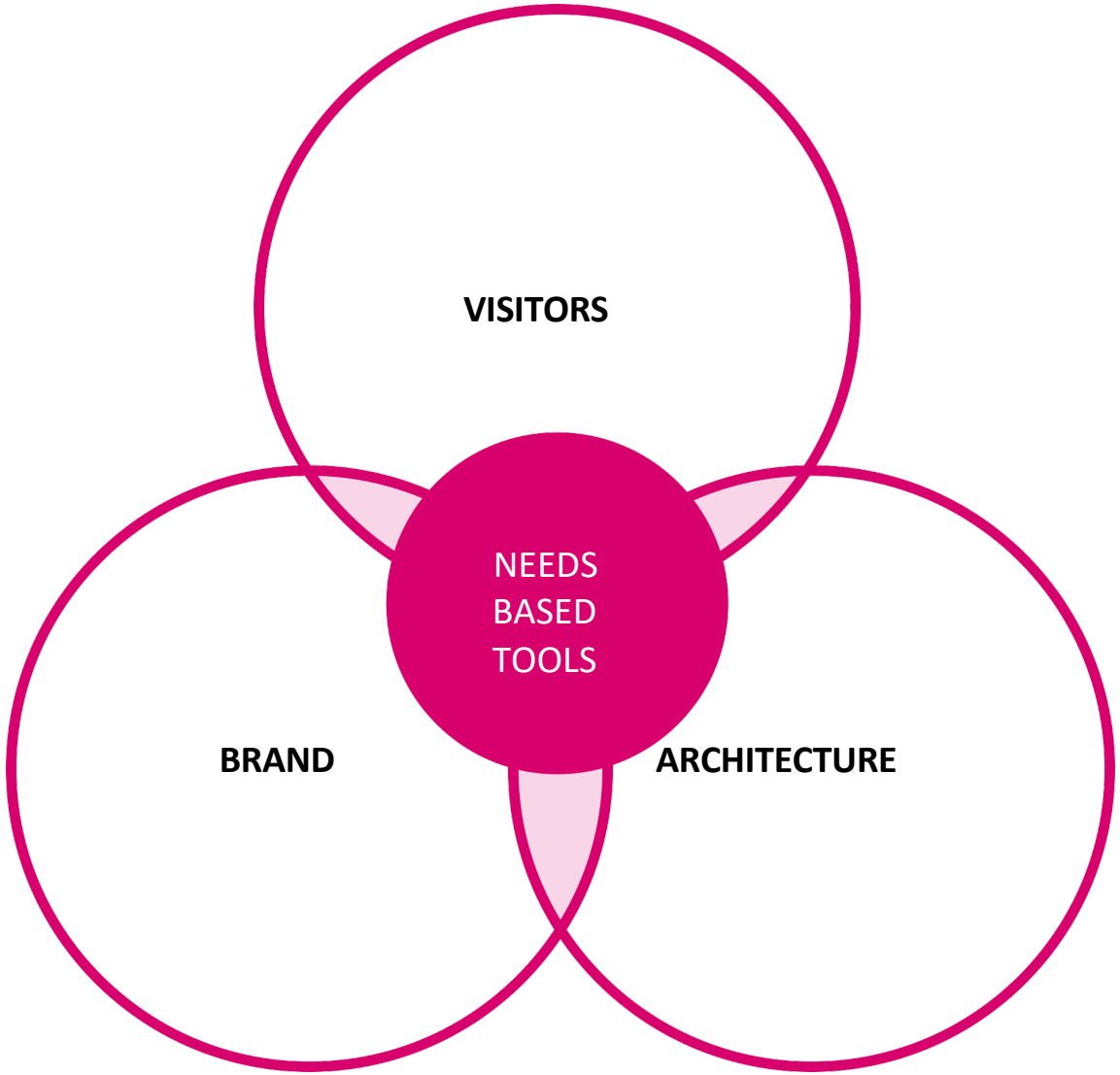
- Recognizable
- ‘Gateways’ confirm you have arrived
- Pathways and visible vertical circulation assist in navigating the space
- Finishes, lighting, and technology integrations become navigation cues
- Ceiling heights, intersections, and sightlines impact placement, design and interactivity

BRANDING

- Wayfinding is an extension of the brand
- Typography, color, and other branding are all integrated into the system
- Clearly marks building boundaries
- Draws attention to, or away from, a space
- Well integrated branding helps to confirm they are in the right location
- Use of branding in Placemaking offers the opportunity to adapt the brand into a playful and imaginative manner, creating a unique interaction with the visitor and the brand


VISITORS
BRAND
ARCHITECTURE

TOOL INTEGRATION



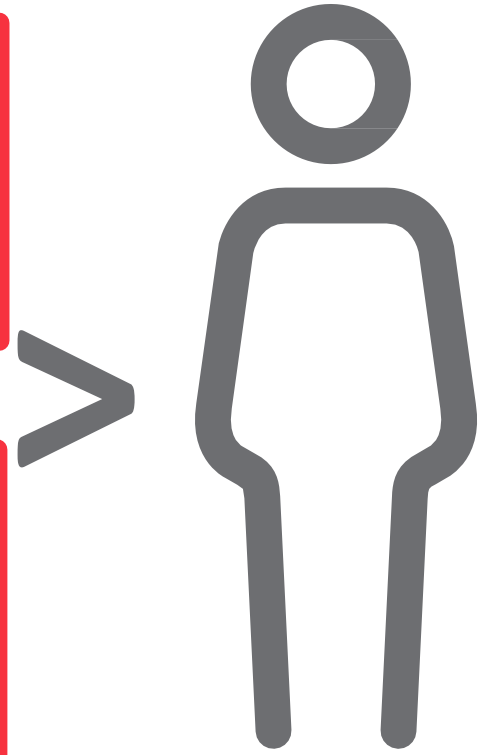
DESIGNING FOR THE VISITOR

FIRST TIME VISITOR

TOURISTS COLLEGE
FRESHMAN HOSPITAL
EMERGENCY

RETURNING VISITOR

LOCAL RESIDENTS
SPORTS EVENTS
SCHOOLS



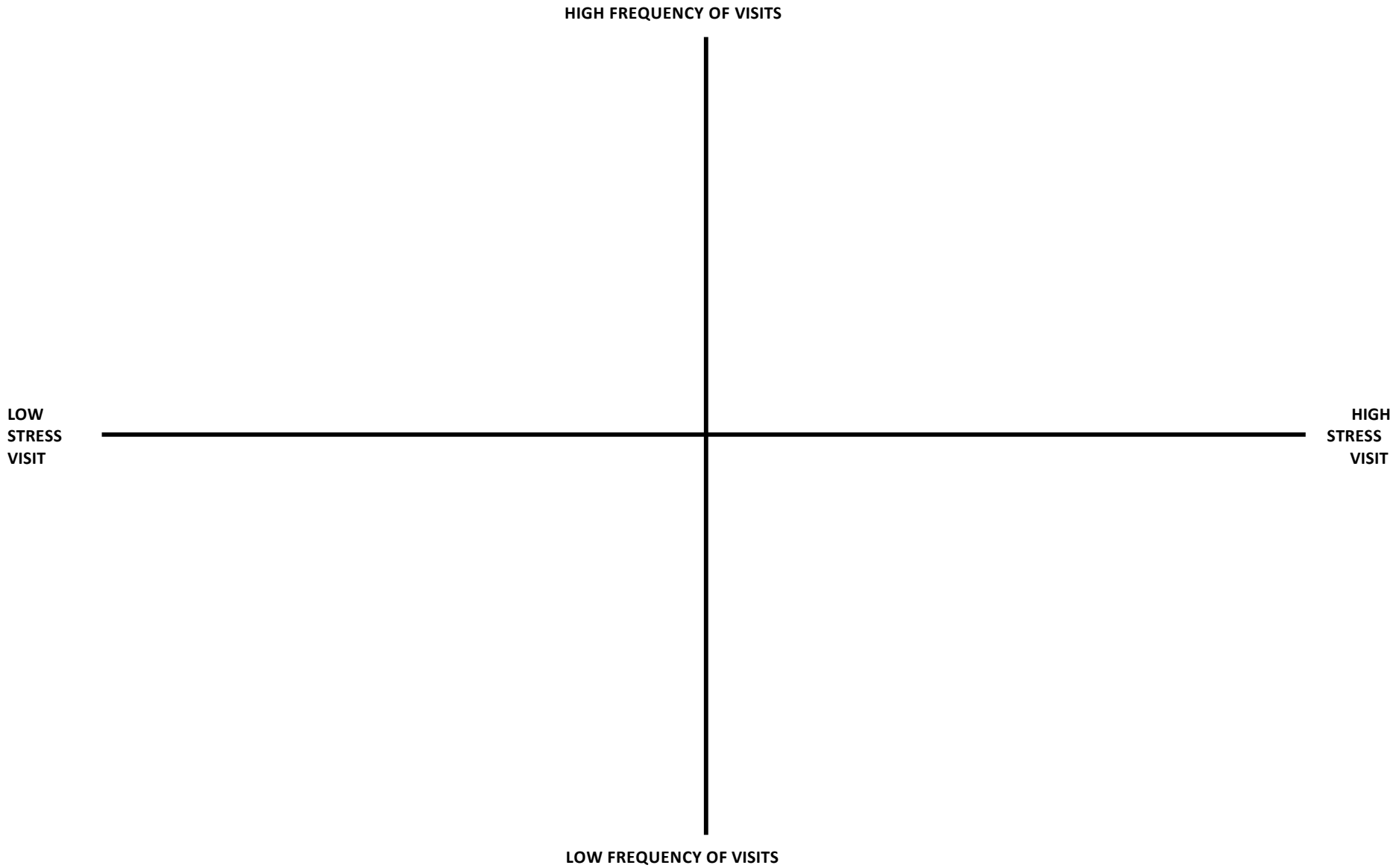
HIGH STRESS VISIT

HOSPITALS
TRANSPORTATION

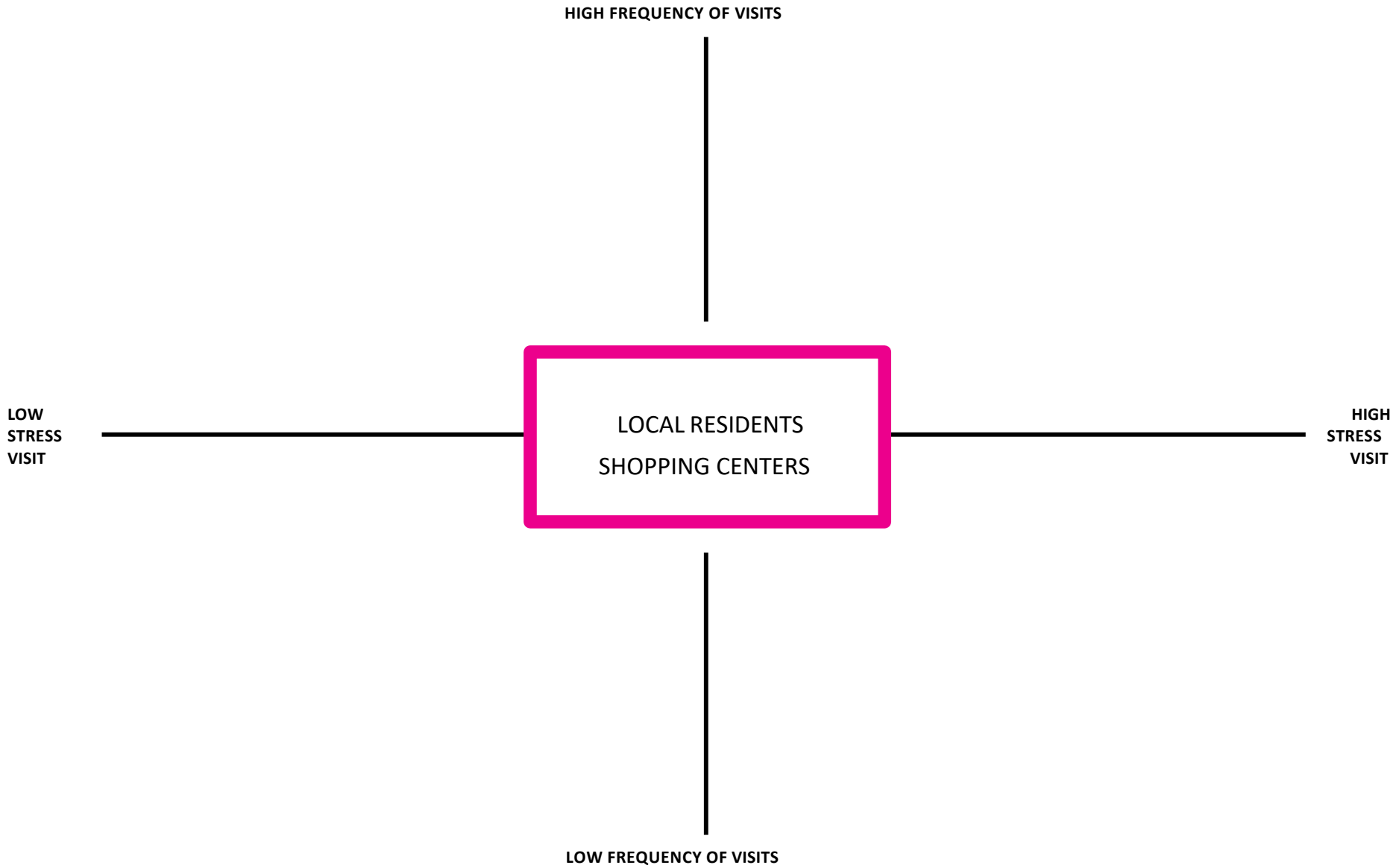
LOW STRESS VISIT

PARKS
CITIES

UNDERSTANDING PEOPLE'S NEEDS



UNDERSTANDING PEOPLE'S NEEDS



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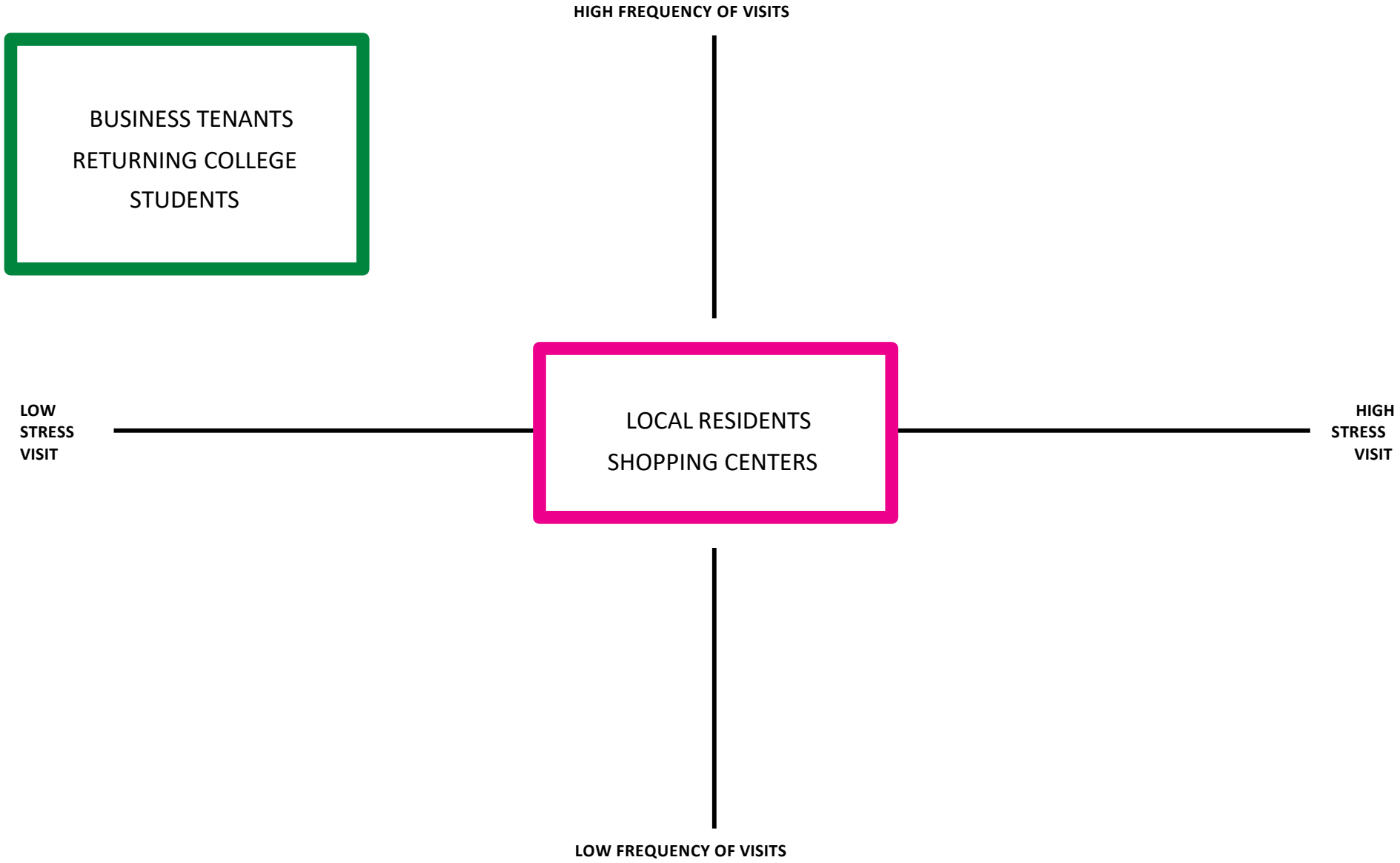

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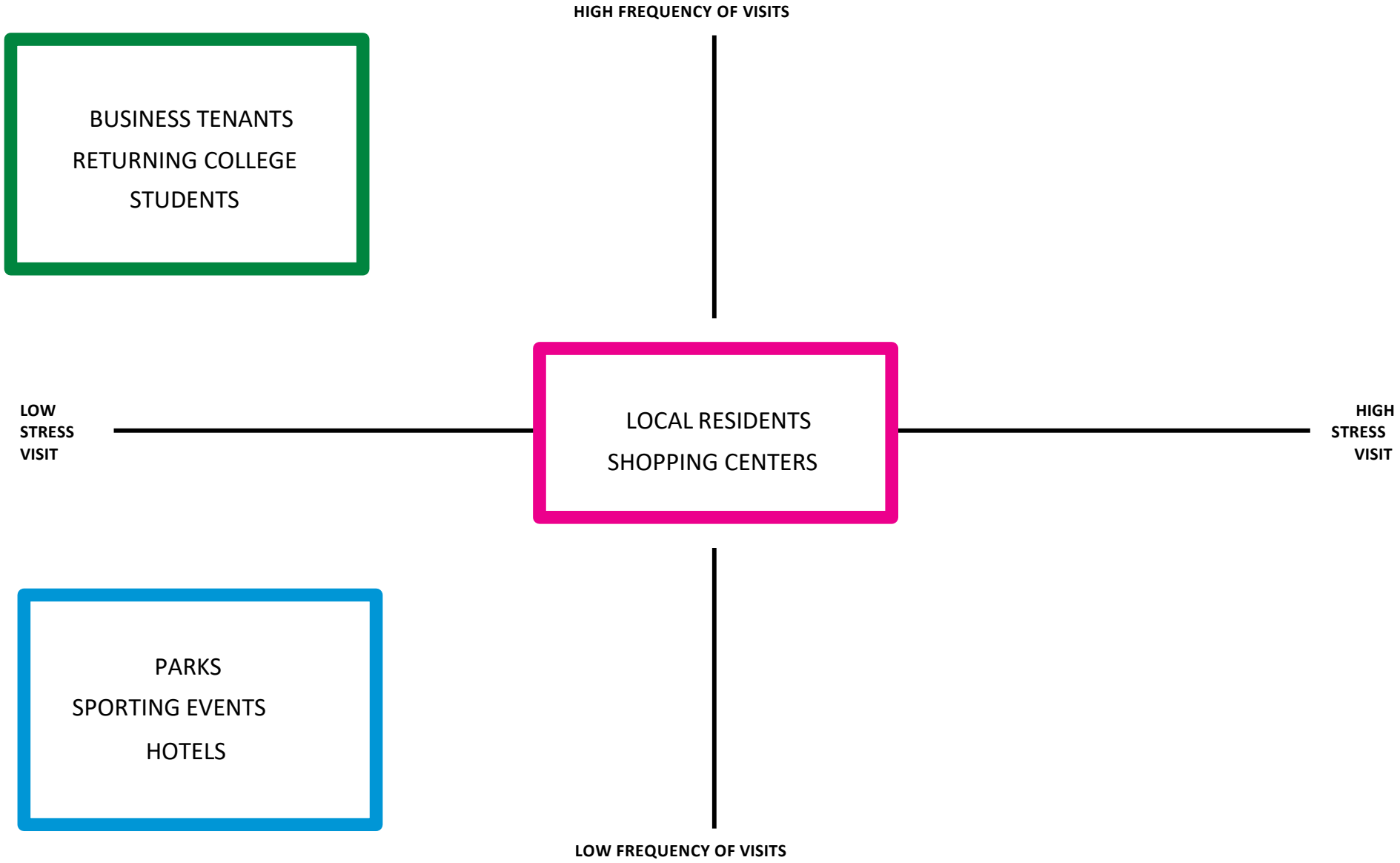
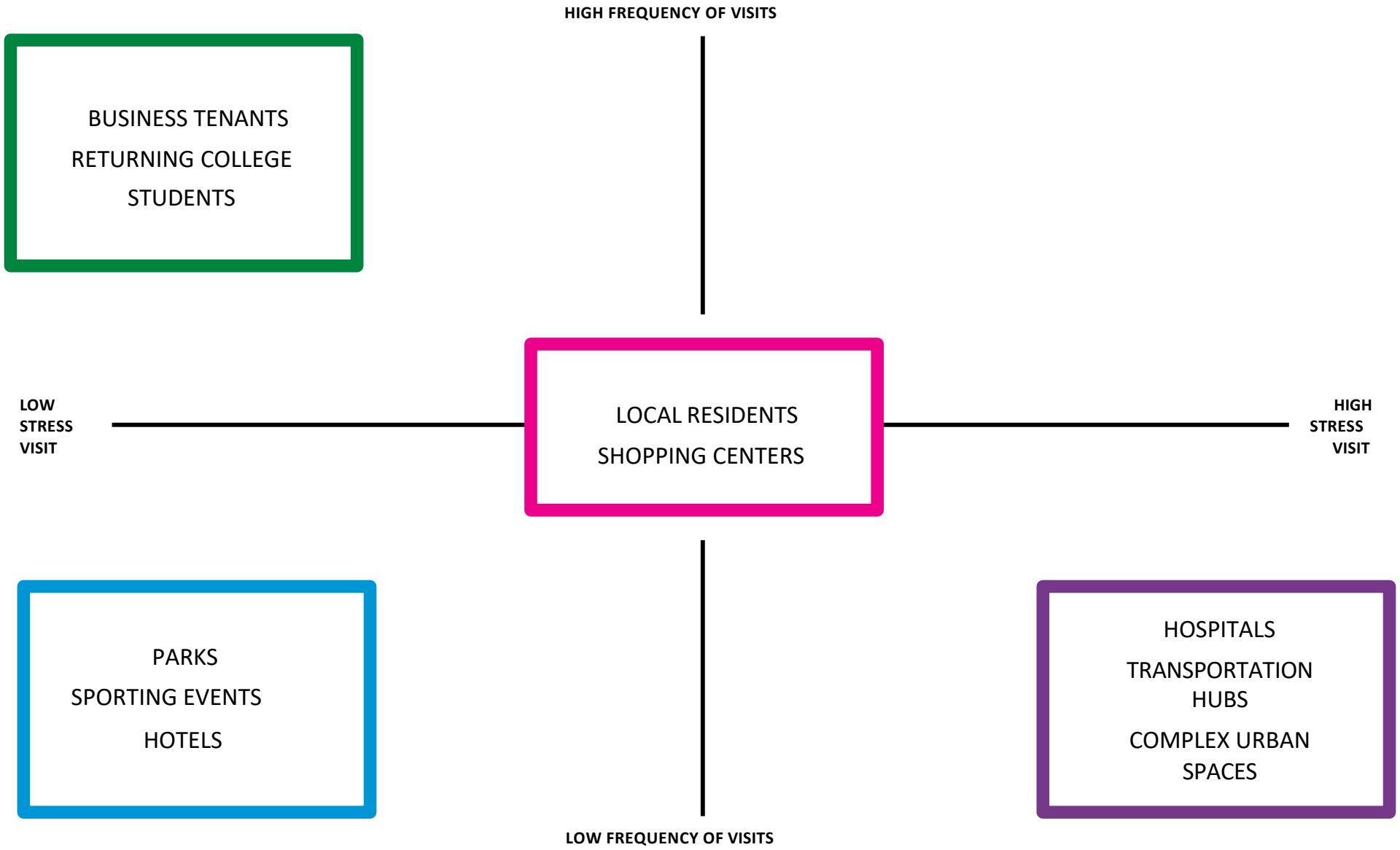
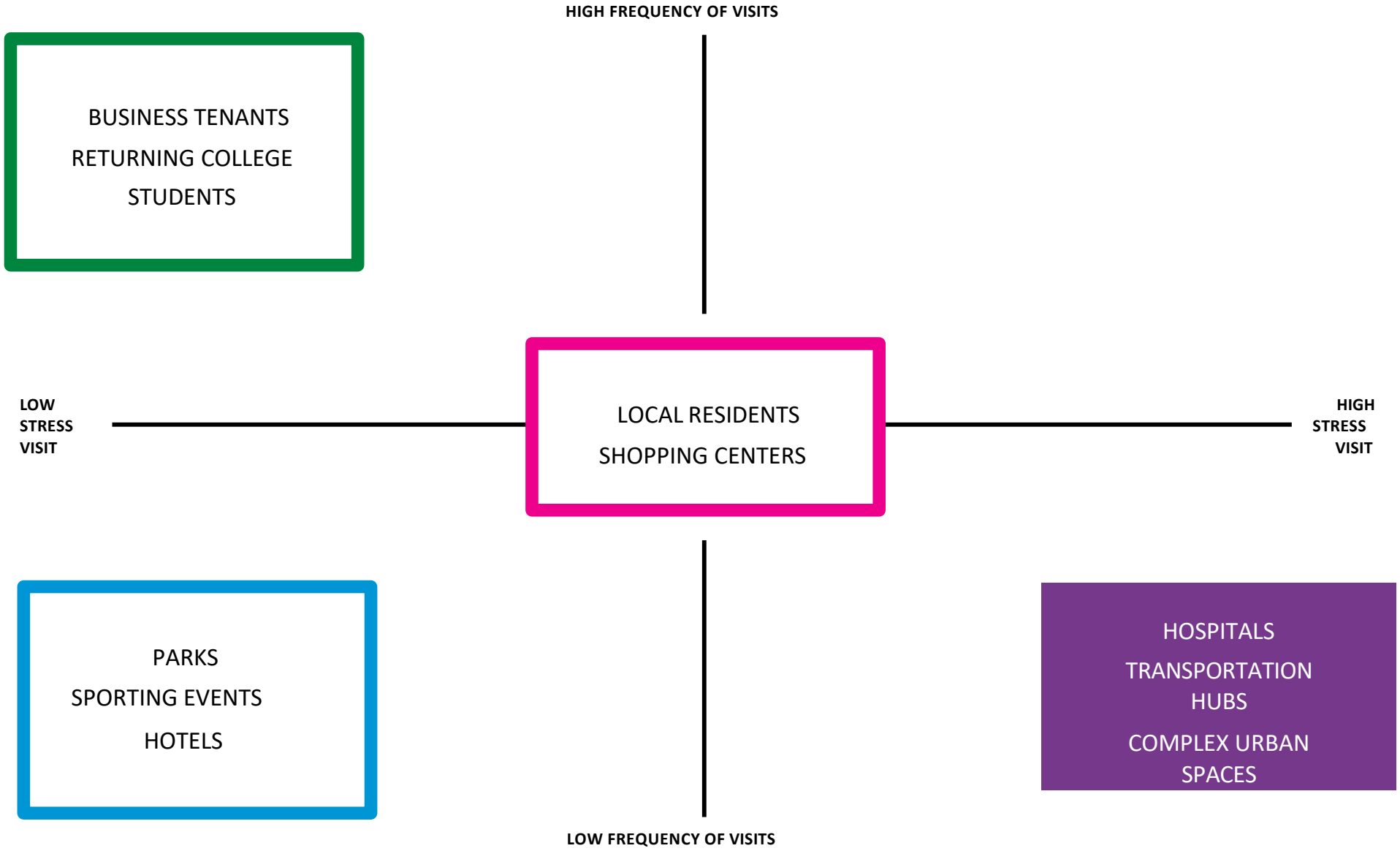


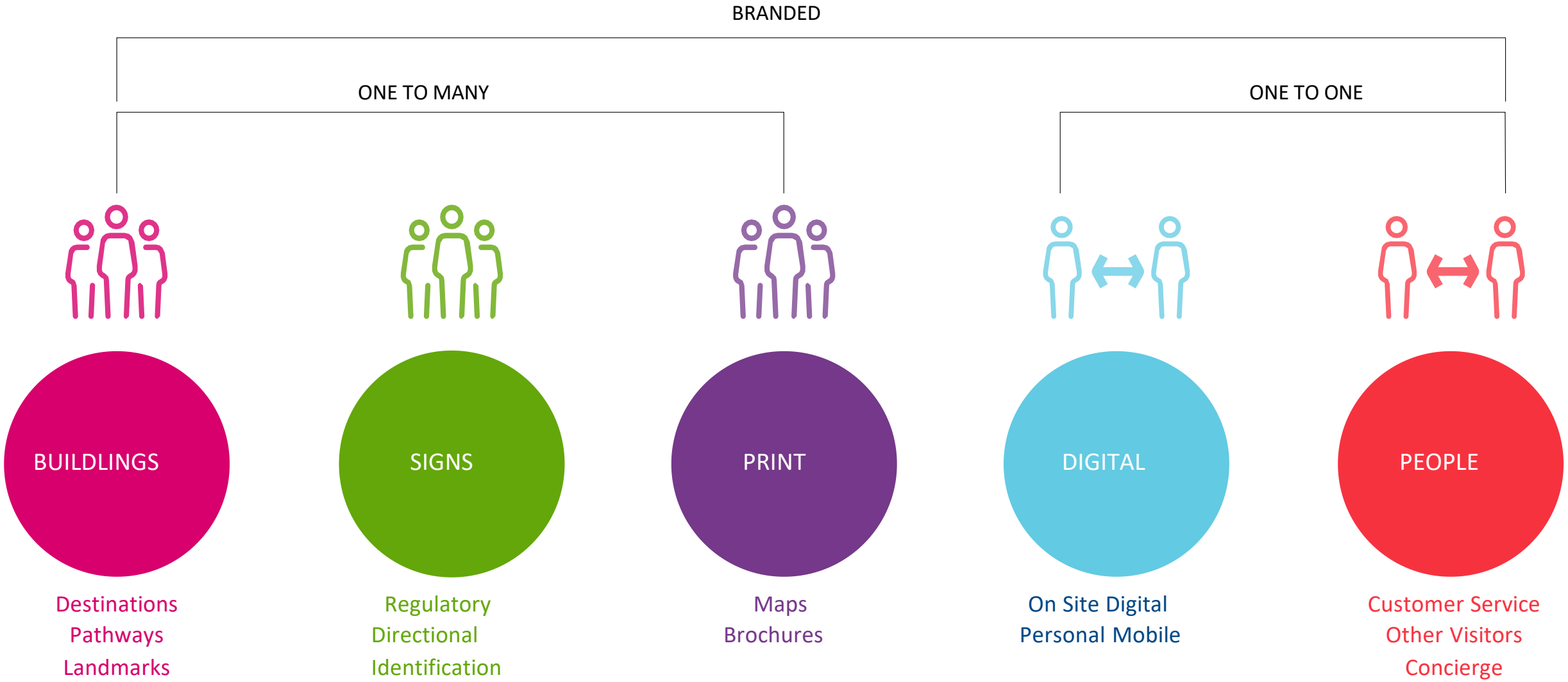
UNDERSTANDING PEOPLE'S NEEDS



UNDERSTANDING PEOPLE'S NEEDS



WAYFINDING TOOLKIT



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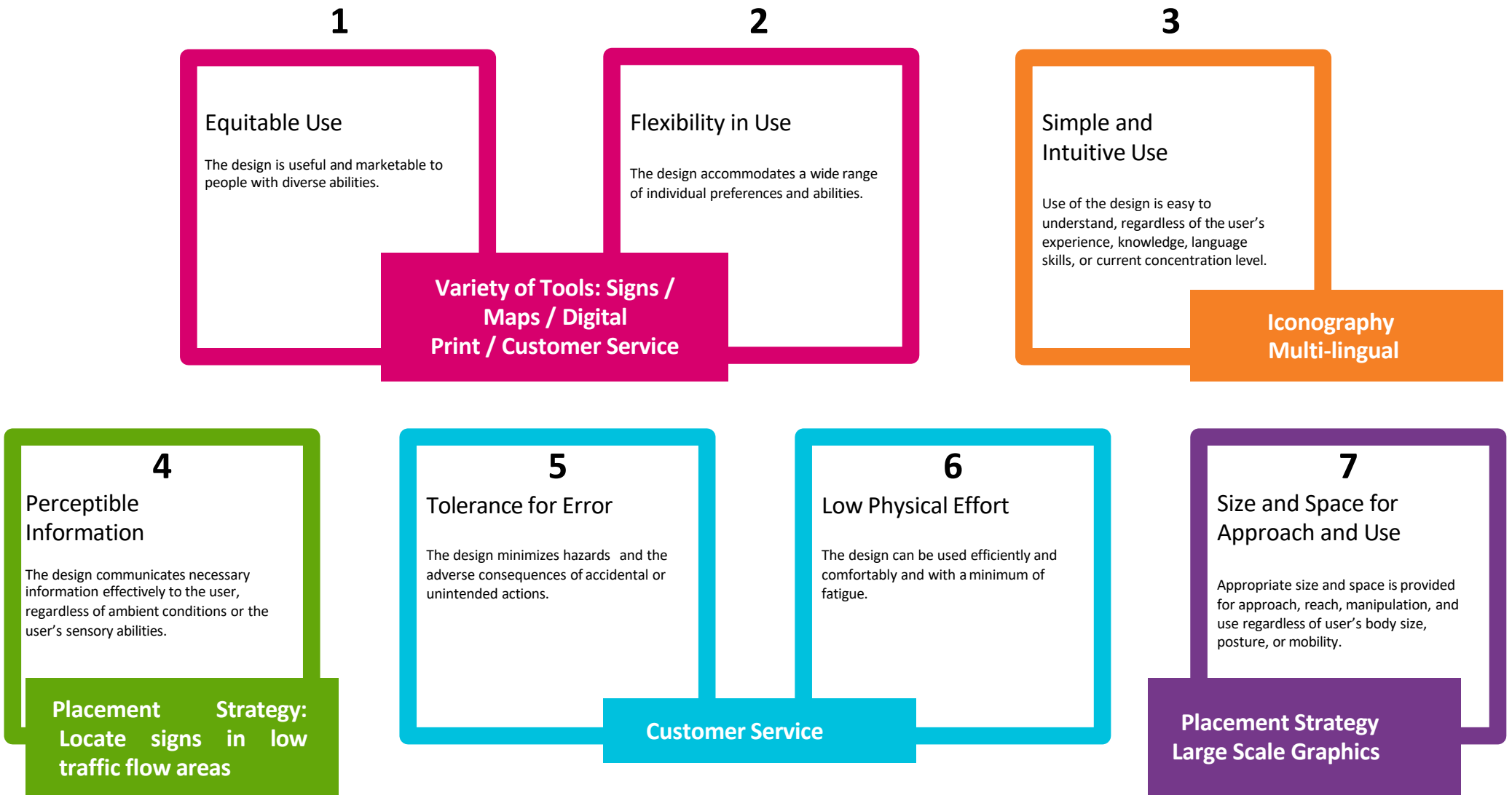

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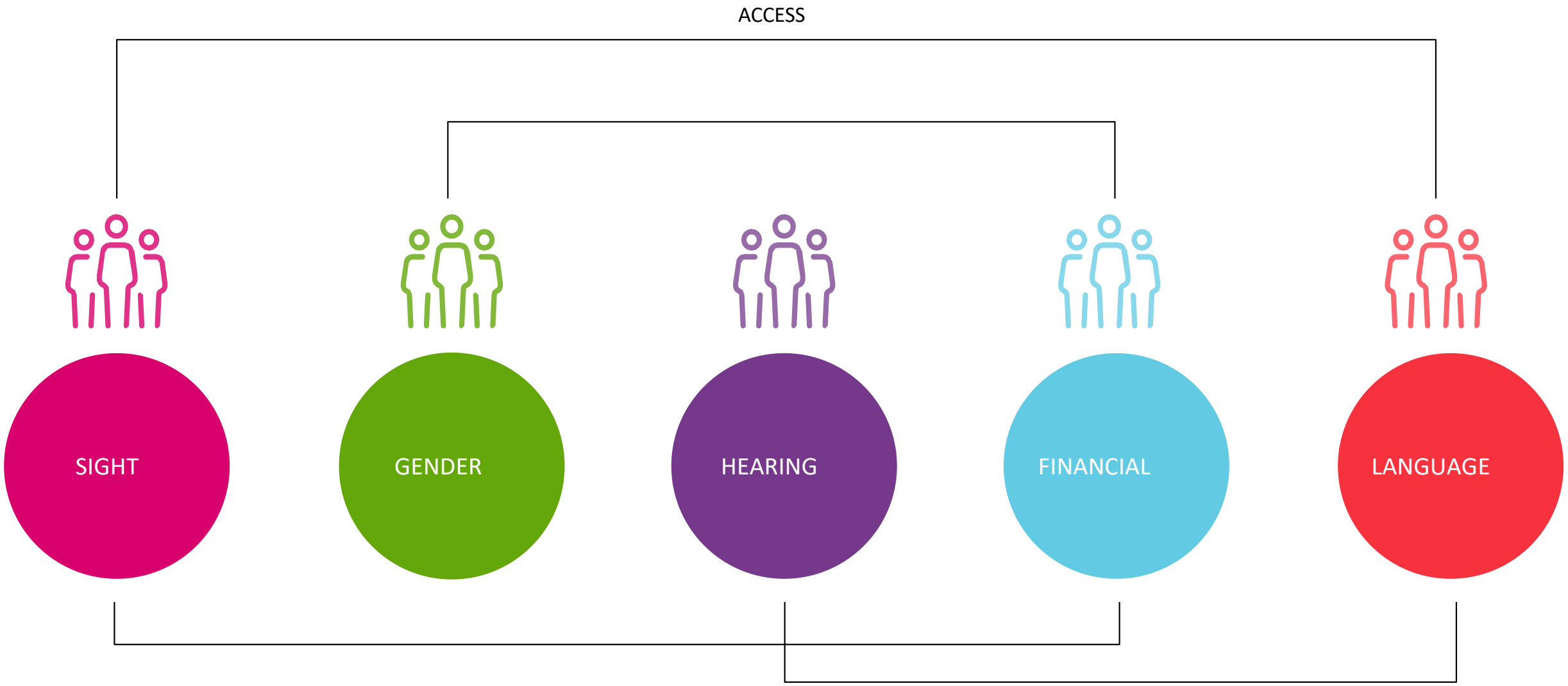
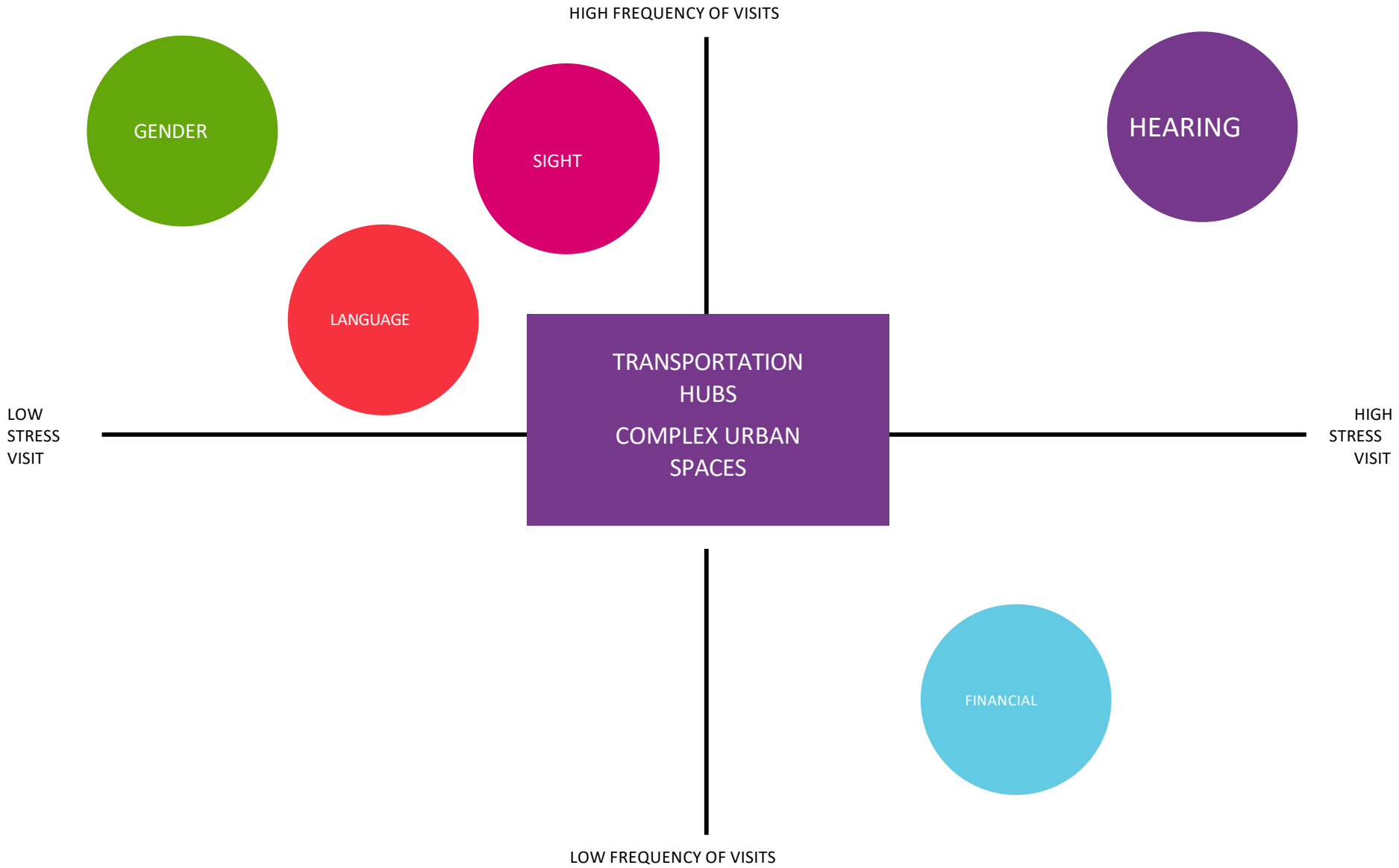


WAYFINDING TOOLKIT




Section 5
Current
Situation
DCAS
Wayfinding,
Signage,
and Users
Department of
Citywide Administrative Services
Cognitive Basis of
Wayfinding
Principles of Wayfinding
Departures
ELEVATOR BANK C
You Are Here
STAIR A
STAIR B
System Consistency

Contents

PROJECTS THAT ARE (OR AREN'T) INCLUSIVE


MTA
PENN STATION
Long Island Rail Road · Subway 1 2 3 A C E

PROJECTS THAT ARE (OR AREN'T) INCLUSIVE

PROJECTS THAT ARE (OR AREN'T) INCLUSIVE

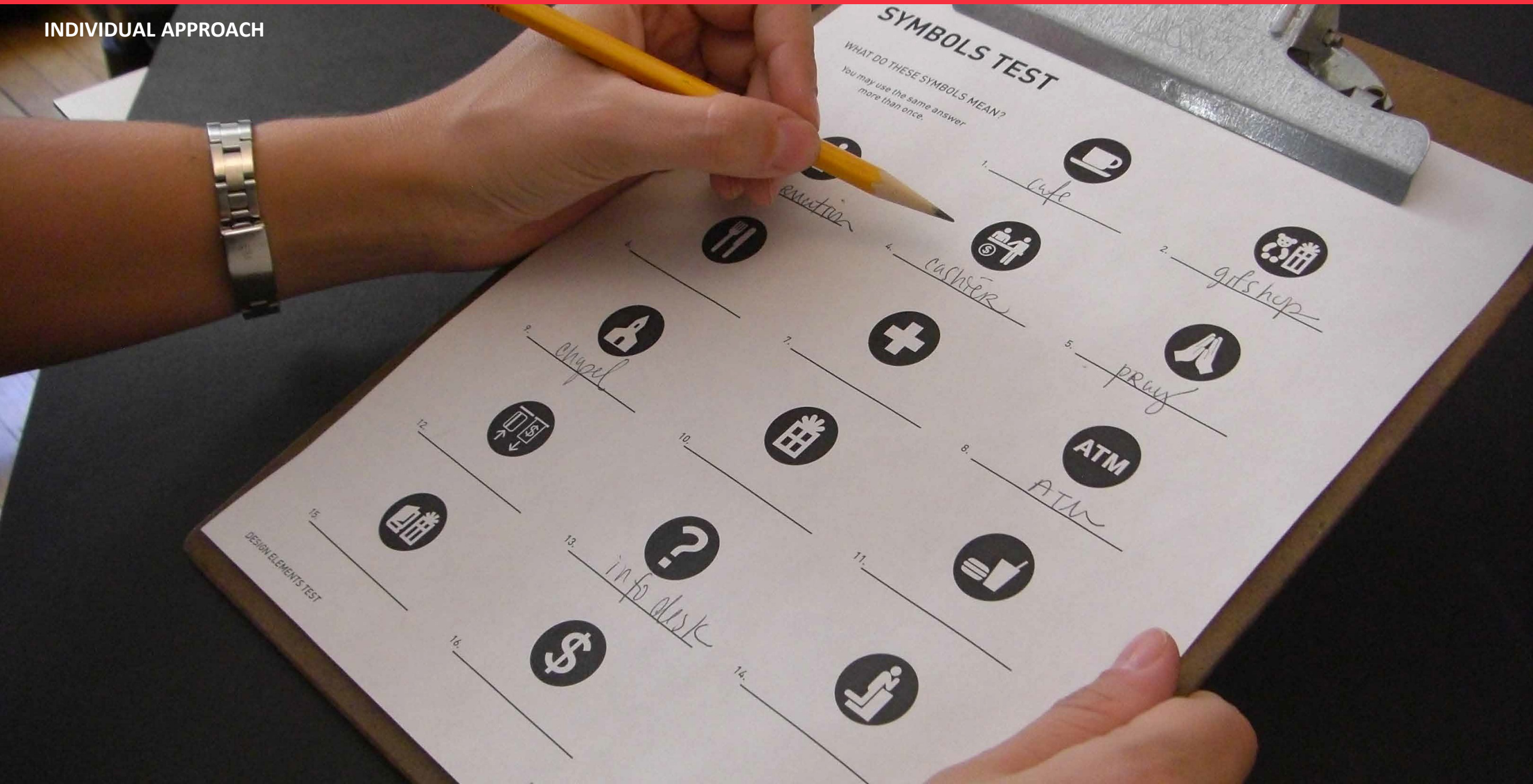

10-4
10-3
10-1
10-2
10-3
10


9-2
9-3
9-4
9-5


17

STAKEHOLDER INVOLVEMENT

INDIVIDUAL APPROACH



NAMING DISABILITIES

www.viacollective.com
katie@viacollective.com

Inclusive Design and Building Performance:
Exploring Synergies with Equity, Sustainability, and Health in the Built Environment

Ethan Lu, IIDA, AIA, NCIDQ, IDEC, LEED AP BD+C
Acting Assistant Chair & Assistant Professor of Interior Design
Fashion Institute of Technology

April 29, 2022

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FIT Interior Design Department Fashion Institute of Technology State University of New York

Council for Interior Design Accreditation

CIDA Professional Standards 2022

https://www.accredit-id.org/professional-standards

Standard 7. Human-Centered Design

Interior designers apply knowledge of human experience and behavior to designing the built environment.

Intent: This standard ensures that graduates understand theories of human-centered design, and identify, analyze, and apply information from a variety of stakeholders and sources to develop a successful response to user needs and to promote health and wellbeing.

Student Learning Expectations

Student work demonstrates **understanding** of:

a) theories related to the impact of the built environment on human experience, behavior, and performance.[1]

b) the relationship between the designed environment and human experience, wellbeing, behavior, and performance.[2]

Student work demonstrates the **ability** to:

c) gather and apply human-centered evidence.[3]

d) analyze and synthesize human perception and behavior patterns to inform design solutions.

e) apply human factors, ergonomics, inclusive, and universal design principles to design solutions.[4]

f) apply wayfinding techniques to design solutions.

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4 Universal design refers broadly to "the design of products and environments to be useable by all people to the greatest extent possible, without the need for adaptation or specialized design." Quote attributed to Ron Mace, excerpted from North Carolina State University Center for Universal Design website. ADA and similar Canadian regulations are addressed in Standard 16. Inclusive design refers broadly to current social-political issues related to inclusion and considers the full range of human diversity with respect to ability, language, culture, gender, age, and other forms of human difference. Design for inclusion includes a range of solutions in the built environment versus one design solution that accommodates multiple users. Examples could include gender neutral restrooms, non-gendered iconography and signage, cultural appropriation, etc.

NIH National Institutes of Health
Office of Equity, Diversity, and Inclusion

Ethnic hairstyles. Sports mascots. Runway fashion. We've all seen examples of cultural appropriation. Yet, the difference between cultural ***appropriation*** and ***appreciation*** is not always clear. Think of cultural appropriation as the "selecting of certain aspects of a culture, and ignoring their original significance."[1] In March 2018, the Oxford English Dictionary defined cultural appropriation as: "The unacknowledged or inappropriate adoption of the practices, customs, or aesthetics of one social or ethnic group by members of another (typically dominant) community or society."[2]

Social media, print media, and television programs can inspire us to appreciate the beauty and uniqueness of people from different backgrounds. Appreciating different cultures and traditions is encouraged with some caution—culture is not a hobby or a collectible item, it is a meaningful part of life, identity, and community. To start appreciating a culture different from your own, begin with good intentions and learn about the culture. This involves avoiding the temptation to assign new meaning to "cultural markers (such as food, clothing, or physical appearance)."[3]

https://www.edi.nih.gov/blog/communities/appropriation-and-appreciation-whats-difference

Challenge for Designers: **"The difference between cultural appropriation and appreciation is not always clear."**

In the spring of 2021, we asked our 5th semester interior design students to design a **Black Lives Matter Memorial Museum**

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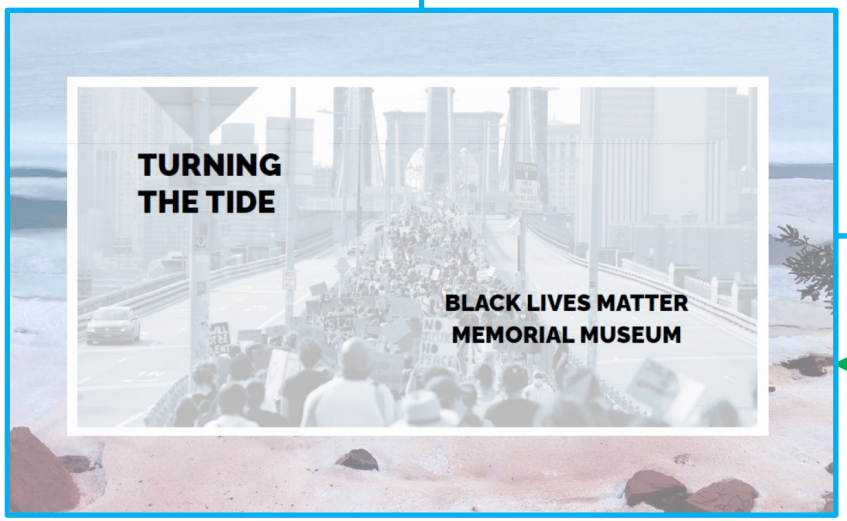
Fashion Institute of Technology

Semester 5		Credits
MAJOR AREA	ID 315 - Interior Design Studio V	4
	ID 347 - Lighting Design	2
	ID 381 - Design Technology III	4
RELATED AREA	choice - see Requirements*: Related Area Elective(s)	3
LIBERAL ARTS	choice - see Requirements*: Liberal Arts	3

ID 315 — Interior Design Studio V
4 credits; 8 lab hours
This studio course introduces students to the holistic strategies and principles of integrated design for interior environments. Students apply in-depth programming research, fact-finding skills and design analysis methods. The complexity of sustainable design decisions that have an impact on global and local environments, economy and human health are explored. Inclusive design, design for activity, and building codes are covered.
Prerequisite(s): ID 281.

ID 381 — Design Technology III
4 credits; 2 lecture and 4 lab hours
This course addresses the design and control of interior environments as it relates for human comfort levels through the supply of heating, ventilation, air conditioning and plumbing systems, including the various electrical systems and sub-systems. The various regulations that govern the design, construction and occupancy of building interiors relative to public health, safety and welfare are addressed. Zoning ordinances, state building and energy codes, federal occupational regulations, fire prevention, egress, barrier-free accessibility (ADA) and administrative requirements are covered.
Prerequisite(s): ID 283.



Inclusive Design

Building Performance

Acoustical and Wellness Design Strategies

ID381 Design Technology III Spring 2021
Assistant Professor: Ethan Lu
Student Names: Tajahanae Aiken I Caleign McLoughlin I Manni Wu

SITE ANALYSIS

History & Demographics

- Three-story neoclassical brick warehouse
- Designed by architect James S. Maher in 1914
- Originally occupied by Blackford's Fish Market
- Obtained protected status under Landmarks Preservation Law in the 1970th

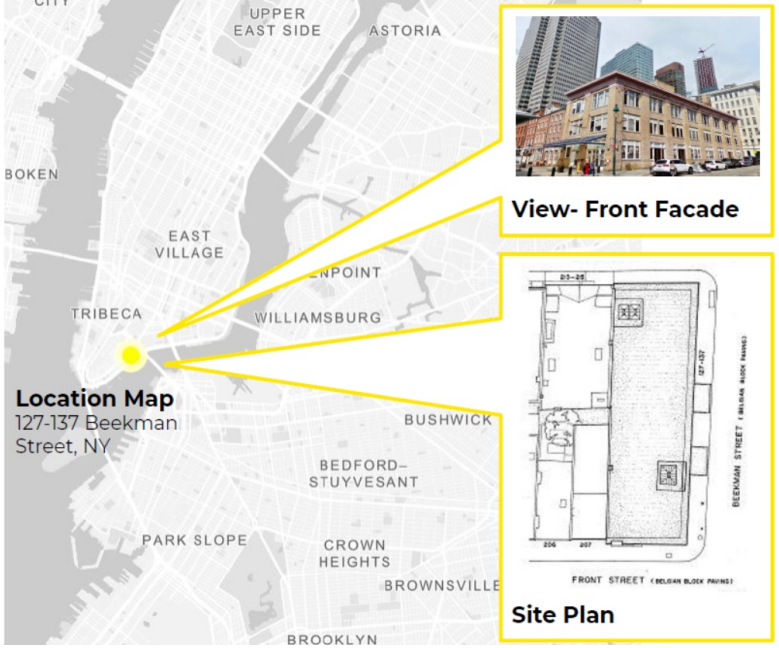
Year Built: 1914

Number of Floors: 4

Square footage: 25,448 sq ft

Group A-3 Occupancy: Assembly

Occupancy: 600 people (approx.)



View- Front Facade

Site Plan

CLIENT DESCRIPTION

Black Lives Matter is, "A global organization in the US, UK, and Canada, whose mission is to **eradicate white supremacy** and build local power to intervene in violence inflicted on Black communities by the state and vigilantes. By combating and countering acts of violence, **creating space for Black imagination and innovation, and centering Black joy,** we are winning immediate improvements in our lives."

MISSION STATEMENT FROM THE BLACK LIVES MATTER ORGANIZATION

BLACK LIVES MATTER

MISSION STATEMENT

The BLM Museum serves as a memorial and educational space that embraces the historical truth about the African American experience in the United States through informational, visual and interactive exhibits.

ID315 ID Studio V Spring 2021, Adjunct Instructor Scott Ageloff

Student Names: Tajahanae Aiken, Manni Wu, Anna Lezhen Moehlman, and Noa Telem

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Inclusive Design: Equity

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Origins of racism in the ancient world/Europe 1

- **Racial discrimination** - prejudice, superiority directed at people who are of different culture, color, race, ethnicity.
- The first humans discovered had very dark skin tones in Africa, and white homoserines didn't enter the scene until later when they migrated up north to Russia.
- Scattered species/tribes for thousands of years

- Racism first really started in the 15th-16th century in Europe (Middle Ages).
- Late 17th century laws were passed forbidding marriages between blacks and whites.
- Exists in the eyes of the people and the way they choose to classify and rank humankind not from a biological point of view
- Religious slavery from every corner of the world - enslaving someone of a different belief than their own.
- Leading historians argue that racism can be traced back to the attitudes of the ancient Greeks to their Persian enemies and that it was adopted, adjusted and re-formulated by Europeans right through until the dawn of the Enlightenment.

CASE STUDY – JIM CROW: Museum of Racist Memorabilia

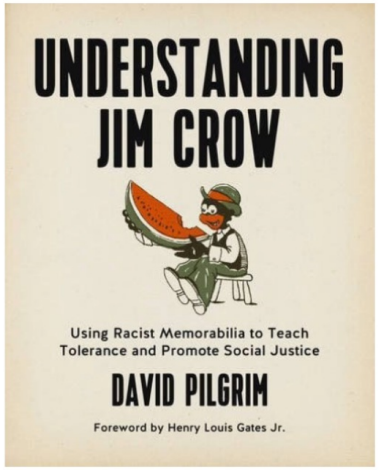
Curator: David Pilgrim
Location: Ferris State University, Michigan

"The museum's mission is to help people understand historical and contemporary racist expressions and to serve as a resource for civil- and human-rights organizations."

The artifacts displayed within the interior are used to enforce conversations through brash artifacts, installations and videos.

The uncomfortable presence the museum has on the viewers evokes an emotional reaction from the visitor.

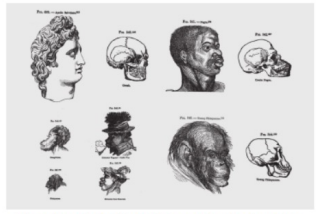
Because of the overwhelming presence the museum they house a seating area that doubles as an auditorium to evoke conversations. The goal of the museum is to have people discuss these unspoken topics and become educated.



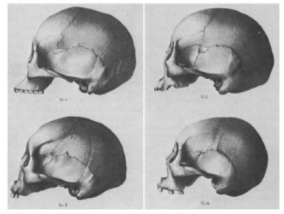
Enlightenment: Europe & America 2

Racism In Colonial and Early America

- **Revolutionary** ideas of freedom and liberty alongside slavery
- **Dispossession** of American Indians and the enslavement of Africans in the era of revolution
- Science legitimized society's racist views (ex. Morton, Nott and Agassiz)
- A **social hierarchy** placed "white" at the top and "black" at the bottom



"Types of mankind or ethnological researches, based upon the ancient monuments, paintings, sculptures, and crania of races, and upon their natural, geographical, philological, and biblical history" (Nott, Gliddon, 1854)



Morton's Ranking of Races by Cranial Capacity

Slave auction in Austin, Texas, circa 1850-1860

ID315 ID Studio V Spring 2021, Adjunct Instructor Scott Ageloff

Student Names: Tajahanae Aiken, Manni Wu, Anna Lezhen Moehlman, and Noa Telem

Inclusive Design: Equity

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ORIGINS OF GLOBAL RACISM & RACISM IN AMERICA

Manni Wu, Anna Lezhen Moehlman, Taj Aiken, Noa Telem

Racism in the **modern world** (global) 3

Holocaust
1941-1945

Apartheid
1948-1990

Japanese Internment Camps
1942-1946

Armenian Genocide
1915-1918

American Racism 4

- Segregation
- Black Face
- Police Brutality
- White Privilege
- Jim crow
- Criminal injustice
- Systemic Discrimination
- Supremacy of white standards
- Racial hatred

"But race is the child of racism, not the father."

Ta-Nehisi Coates, "Between the World and Me", New York:Spiegel & Grau,2015

By utilizing stolen resources colonizers decided to take it a step further allocating their internalized patterns of past traumas onto the land's predecessors.

How has education participated in taking us to where we are?

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Inclusive Design: Equity

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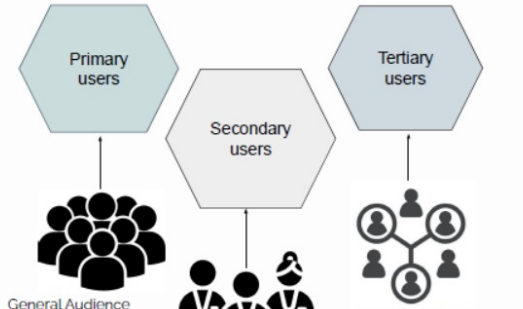
USER GROUPS & DEMOGRAPHICS

USER GROUP DEMOGRAPHICS

USER GROUPS



VISITORS AGE RANGES

- Kids, Babies and Toddlers (0-12 Years of age)
- Adolescents (13-18 Years of Age)
- Young Adults/ Adults (18- 40's Years of Age)
- Middle Age Adults (40's & above Years of Age)

SURVEY OF AMERICANS WHO VISITED ART GALLERIES BY AGE & EDUCATION LEVEL

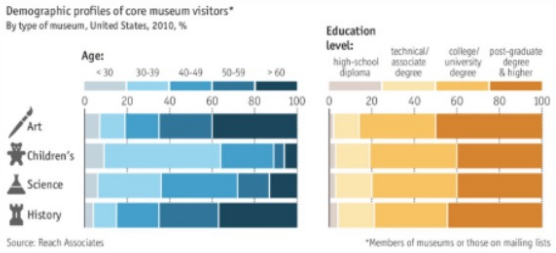


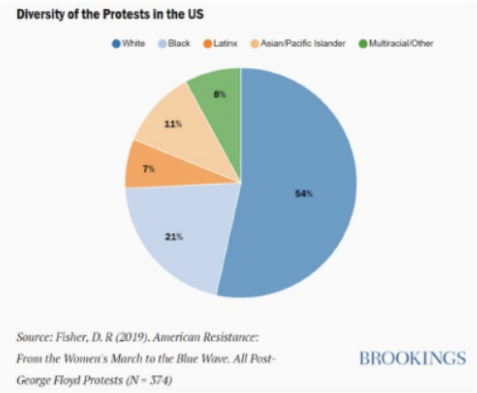
Figure 3a. **Demographic distribution of visitors to art museums/galleries in 2008**

	% of visitors to art museums	% of U.S. population
By race/ethnicity		
Hispanic	8.6%	13.5%
Non-Hispanic White	78.9%	68.7%
African American	5.9%	11.4%
Other	6.6%	6.4%

USER GROUPS & DEMOGRAPHICS

PRIMARY USERS

The increased diversity of the crowds in the streets is a very good sign for racial equity in our country. It is due, in part, to progressive groups mobilizing their constituents to join the protests in solidarity. In a recent statistic study reported by Pew Research, most Americans agree that the country needs to do more to achieve racial equality. For example half of Americans agree that would be very effective to organize protests and rallies to generate some form of a change and that getting together to talk about race would help to formalize racial equity. Therefore it is our primary goal to provide a space where the users will be able to engage with these movement and address their concerns.



DISABILITY & SPECIAL NEEDS

People with disabilities are part of our community. In museums, they are also our colleagues, artists and even our visitors. Disability is part of the human experience, and disability pride is about embracing the differences. It is our primary goal to provide accessible spaces where every one will feel equally treated and respected. By providing a safe environment with sufficient ramps and easy access to the elevators we encourage our community to engage in the spaces provided. We also encourage our visitors to engage with other technological functions redirected towards the conmortability of our disable community

ID315 ID Studio V Spring 2021, Adjunct Instructor Scott Ageloff

Student Names: Joanna Bak, Elizabeth Echeverry, Lidia Liviola, and Natalie Thompson

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Steven Winter Associates, Inc.

Inclusive Design: User Groups, Disability & Special Needs

FIT Interior Design Department Fashion Institute of Technology State University of New York

MAJOR DESIGN CONCERNS

Universal and Inclusive Design

Black Lives Matter is an inclusive movement and disability is an **intersectional** issue. Narratives about Black disabled people are often left out of conversations

Partner with organizations such as **The National Alliance of Multicultural Disabled Advocates** (NAMD) to make sure needs are extensively met

All spaces and activities will be designed with the diversity of all users in mind

Protests are less accessible to those with disabilities—the BLM memorial will organize volunteers to help **accommodate those with disabilities and special needs**

MAJOR DESIGN CONCERNS

Sustainable Design

Environmental justice and racial justice are intertwined —the BLM Memorial Museum will implement sustainable design practices by:

Using **sustainable materials** in the design

Harnessing **natural daylight** through a skylight, maximizing light the space + saving electricity

Incorporating **sustainable solutions** for museum staff and visitors—committing to plastic-free solutions

Educational resources and exhibitions will highlight intersection between race and environmental justice

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Inclusive Design: Accessibility, Environmental Justice & Racial Justice

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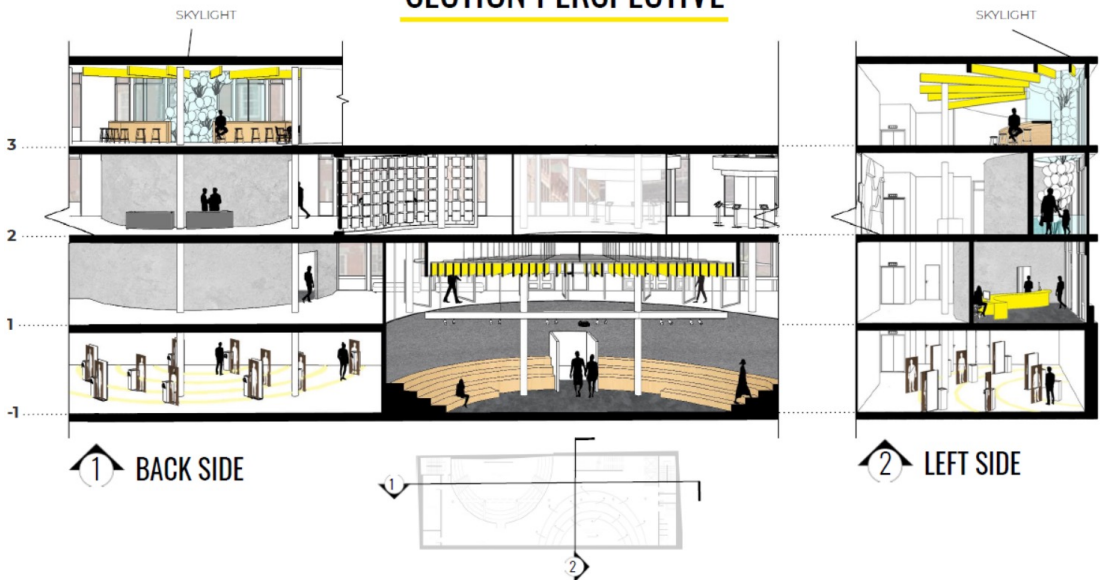
SECTION PERSPECTIVE



CONCEPT

Target is a literal and symbolic representation of the Black experience in the US. From being targeted by police in their daily lives to systemic discrimination deeply entrenched in American culture, Black people have to endure a reality of being endangered and singled out.

Through architectural features, content, and installations, visitors to the Black Lives Museum will be inspired to understand and relate to the experience of being targeted and reflect on their own roles in this destructive dynamic thus redirecting the "target" on themselves. The museum will showcase the multiple achievements and contribution of Black Americans to all spheres of American life in order to celebrate African American culture, dispel stereotypes, and unite all people.

2ND FLOOR - INFORMATIONAL AREA

BASEMENT - "JOURNEY THROUGH THE SHADOWS" EXHIBIT

"DREAMBOX" EXHIBIT

2ND FLOOR - "FREEDOM" BALLOONS EXHIBIT

1ST FLOOR - "TARGET" EXHIBIT

ID315 ID Studio V Spring 2021, Adjunct Instructor Scott Ageloff

Student Names: Tajahanae Aiken, Manni Wu, Anna Lezhen Moehlman, and Noa Telem

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Inclusive Design: Students' Design Concepts

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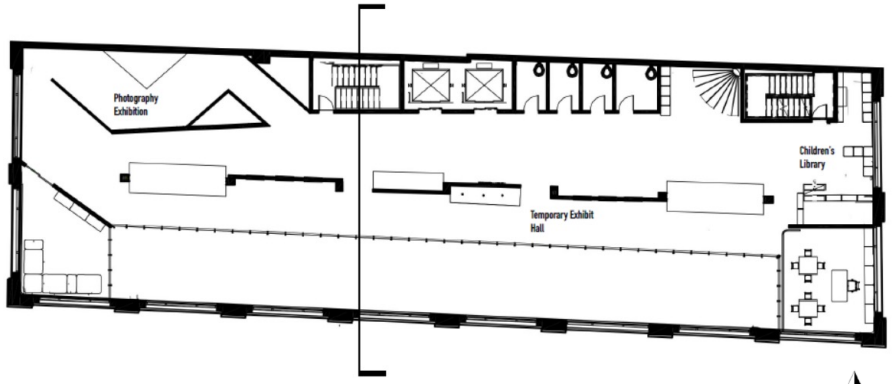
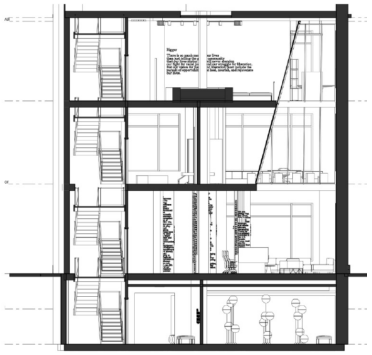


Second Floor: Floor Plan

Our mission for the Black Lives Matter Museum is simply to design a place to commemorate and celebrate the resilience and passion of the Black community. Our goal in designing this museum is to aid viewers in the discovery of hidden truths and admiring accomplishment of black lives. We envision a space that will be embraced by everyone that visits. We are hoping to help improve society's outlook on black lives and support the Black Lives Matter movement.

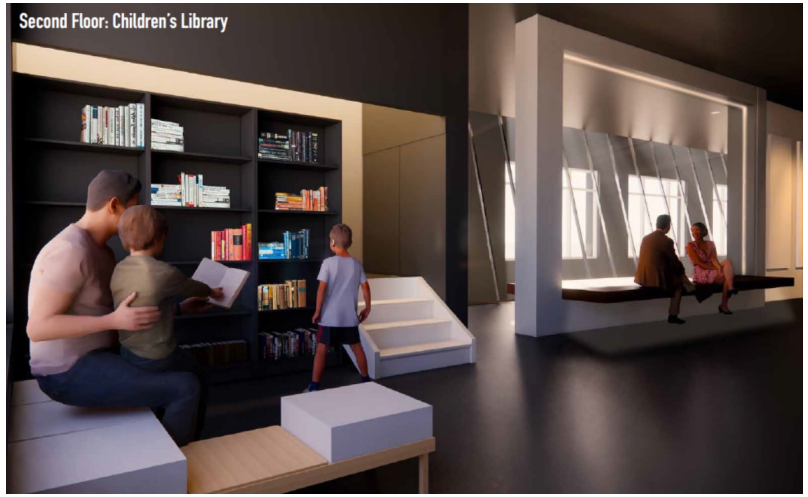


Section Cut

Basement: 'Scars' Latern Exhibit

First Floor: Reception/Lobby Area

Second Floor: Children's Library



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Student Names: Paige Maggio, Aliana-Mia Torres, and Anny Cai

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Inclusive Design: Students' Design Concepts

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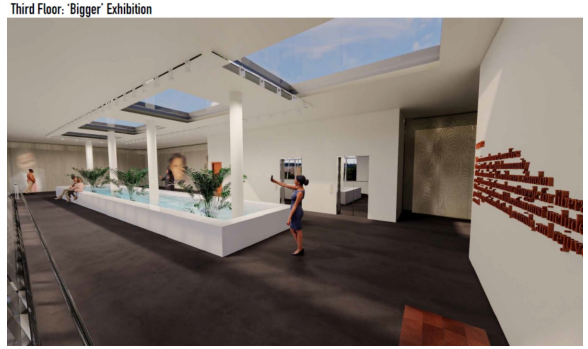
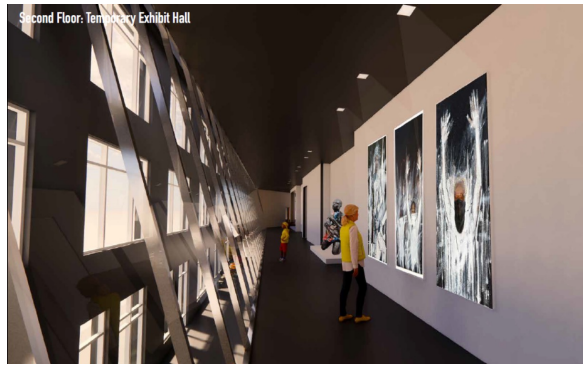
First Floor: '7 Demands' Exhibition

First Floor: Cafe Area

Third Floor: 'Bigger' Exhibition



Second Floor: Temporary Exhibit Hall



Basement: 'Action' Film Exhibition

Second Floor: Photography Exhibition

Inspiration & Concept

•Basement: Past historical and emotional experience to remember the lives and talent that was lost .
•1st Floor: Present demands of Black Lives Matter, what they want.
•2nd Floor: Ongoing events due to the 7 demands not being met from people and government.
•3rd Floor: Looking towards the future which hopes for peace, forgiveness, and reconciliation after the history of turmoil and mistreatment. The airy space provides a sense of relief and ease which celebrates figures who have overcome adversity and represent Black culture at large.

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Inclusive Design: Students' Design Concepts

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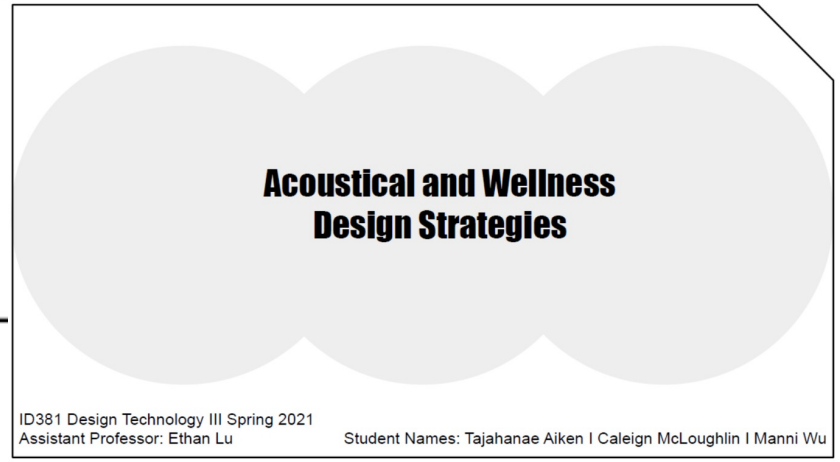
DESIGN CONCEPT: BLACK LIVES MATTER MEMORIAL MUSEUM

Within this interior environment we aim to create an open and inviting atmosphere for staff and visitors through architectural features that will be done in minimal colors. We plan to use acoustical properties within the ceiling to facilitate better conversations and sound quality within the environment, as well as the use of sustainable and wellness design strategies within our floor and wall material. With these subtle architectural enhancements we aim to create a space that allows viewers the opportunity to discuss, experience and learn about the subjects at hand.



ID381 Design Technology III Spring 2021, Assistant Professor Ethan Lu

Student Names: Tajahanae Aiken, Caleigh McLoughlin, and Manni Wu

be ex building energy exchange

Steven Winter Associates, Inc.

Building Performance: Integrating Acoustical, Day Lighting, and Wellness Strategies

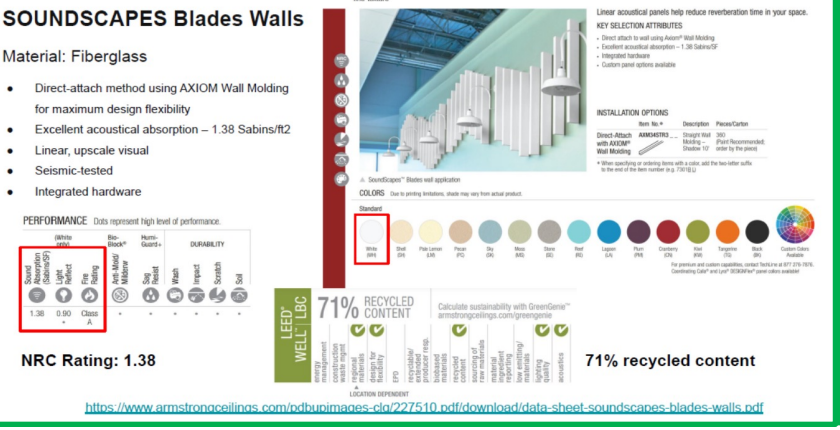
FIT Interior Design Department Fashion Institute of Technology State University of New York

WALL OPTION 1

SOUNDSCAPES Blades Walls

Material: Fiberglass

- Direct-attach method using AXIOM Wall Molding for maximum design flexibility
- Excellent acoustical absorption – 1.38 Sabins/ft2
- Linear, upscale visual
- Seismic-tested
- Integrated hardware



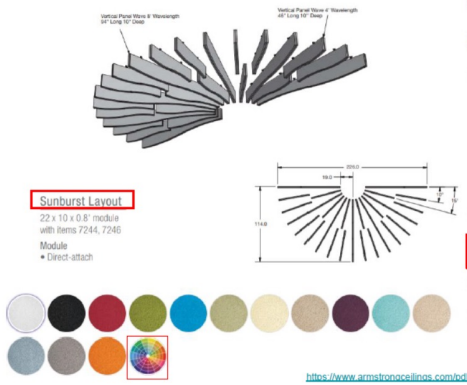
NRC Rating: 1.38

71% recycled content

https://www.armstrongceilings.com/pdbupimages-clo/227510.pdf/download/data-sheet-soundscapes-blades-walls.pdf

CEILING OPTION 1

Soundscape Blades



Sunburst Layout
22 x 10 x 0.8' module
with items 7244, 7246
Module
• Direct-attach

SoundScapes® Blades™ offers virtually unlimited design options. Your choice of shapes, depths, colors, and installation options.

SoundScapes® Blades™ panels offer many benefits:

- Three installation options for maximum design flexibility
  - Attach to standard 15/16" suspension system
  - Suspend individually using a hanging kit
  - Direct-attach to both ceilings AND walls using Axiom® Wall Molding
- Hundreds of design combinations
- Reduce noise and define spaces
- Integrated hardware
- Available in White and 13 standard Colorations® colors or made-to-order Sherwin-Williams® colors

https://www.armstrongceilings.com/pdbupimages-clo/217545.pdf/download/soundscapes-blades-linear-acoustical-panels.pdf

FLOOR OPTION 1

Armstrong Flooring - Croissant

Material: Bio Flooring

- This product does not contain chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372. All components are on TSCA inventory. This product does NOT contain asbestos.
- Pattern/color wear performance: High durability Gouge resistance Appearance retention
- **The test was conducted in accordance with ASTM Designation E648-17, "Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source." The test is also known as NFPA No. 253.**

- BioBased, PVC-free formulation
- Made with rapidly renewable material*, US-grown plant ingredients
- 40% pre-consumer recycled content
- Ortho-Phthalate Free
- Low carbon footprint-main ingredient is 85% North American limestone locally quarried, further reducing carbon footprint
- Low VOC Emissions and FloorScore® certified
- Meets WELL® Building Standards requirements for: Cleanability, VOC Reduction, Toxic Material Reduction, Material Transparency
- Qualifies for CHPS® Durable and Low Maintenance credit
- Third-party certified Environment Product Declaration (EPD)
- Meets requirements of LEED® V4 material credits (Armstrong Product Declaration-APD)
- Recyclable through the On&On™ Floor Recycling Program.

*This product contains 2% rapidly renewable material which can be regenerated annually.

https://www.armstrongflooring.com/pdbupimages-flr/221601.pdf
https://www.armstrongflooring.com/pdbupimages-flr/219186.pdf

Acoustical Performance (NRC) | **Acoustical Performance (Sabin)** | **Durable & Bio Based**

WALL OPTION 2

SHEETROCK® BRAND MOLD TOUGH® VHI FIRECODE® X PANEL

- **5/8 in. (15.9 mm) Type X panels with very high impact, moisture and mold resistance**
- **Feature a noncombustible, moisture-resistant gypsum core encased in moisture - and mold-resistant, 100% recycled green face and brown back papers**
- Designed and tested to offer greater resistance to surface abrasion, indentation and impact damage than 5/8 in. (15.9 mm) USG Sheetrock® Brand Mold Tough® Firecode® X Panels
- Comply with ASTM C1396, *Standard Specification for Gypsum Board*, for 5/8 in. (15.9 mm), Type X and water-resistant gypsum wallboard

https://www.usg.com/content/dam/USG_Marketing_Communications/united_states/product_promotional_materials/finished_assets/sheetrock-gypsum-panles-mold-tough-vhi-firecode-core-submittal-en-WB2529.pdf

CEILING OPTION 2

Calla Tegular-Smooth texture

Size: 24 x 24 x 1"(#2824)
Material: Wet-formed mineral fiber with acoustically transparent membrane

- Surface Finish Acoustically transparent membrane with factory-applied latex paint
- Total Acoustics ceiling panels have an ideal combination of sound absorption and sound blocking in one product.(Best(NRC 0.85; CAC 35+)
- **Humidity/Sag Resistance HumiGuard® Plus ceiling panels are recommended for areas subject to high humidity, up to, but not including, standing water and outdoor applications.**
- **Anti-Mold/Mildew Ceiling tiles with BioBlock® performance resist the growth of mold and mildew on the tile surface.**
- VOC Emissions GREENGUARD Gold Certified
- High Recycled Content Classified as containing greater than 50% total recycled content
- 30-Year Performance Guarantee & Warranty
- Installed with Armstrong® Suspension System

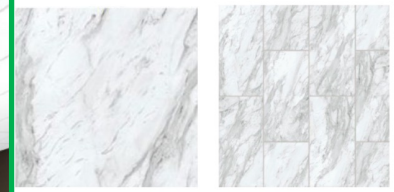
Performance Selection

- Articulation Class:170
- Fire Performance:Class A
- Light Reflect: 0.85
- **Anti Mold/Mildew(Bio-block)**
- **Sag Resistant:HumiGuard+**
- Certified Low Voc Emissions
- **Clean Assure Disinfectable: fog**
- **Durability: Impact,Scratch ,Soil and Wash**

FLOOR OPTION 2

Congoleum Flooring - Carrara White

Material: DuraCeramic



- **Scotchgard protector which repels dirt and mess for easy cleaning and stain release**
- **DuraCeramic adapts to room temperature making it warmer in colder climates. It's coated with Scotchgard Protector with guaranteed stain and dirt resistance. Silver particles infused into the floor provide natural protection against mold and bacterial growth.**

https://www.congoleum.com/product-detail/?sku=DCR01

Congoleum FLOORING

PRODUCT:	DURACERAMIC DIMENSIONS
Construction: Wear Surface:	Nano-composite surface glaze, reinforced with Nylon particles and Aluminum Oxide featuring Scotchgard™ Protector
Base:	Limestone composite
Nominal Overall Gauge:	0.160" (4.1 mm)
Nominal Size:	12" x 24"
Packaging:	20 Sq. Ft. per Carton
Pieces per Carton:	10
Shipping Weight per Package:	36 lbs. per Carton
Passes NBS Smoke Density:	Yes
Passes Critical Radiant Flux (ASTM E-648>0.45w/cm²):	Yes
Passes Motor Vehicle FMVSS 302:	Yes
PEI Rating:	3-4
Static Load Limit:	250 psi
Slip Resistance:	Meets ADA Recommendations
FloorScore Certified:	Yes
Warranty Coverage:	Lifelong Residential
Additional Scotchgard™ Protector (ASTM E-648>0.45w/cm²): Will be easy to clean	15 Years
Will repel dirt and grime	15 Years 5 Year Light Commercial
Installation Method:	Fully Adhered or Floating Installation over UnderFlor in residential application only
Subfloor Application:	On, above or below grade level
Adhesive:	UnderFlor® DS100 pressure-sensitive adhesive
Adhesive Coverage: Fully Adhered:	200 to 250 sq. ft. per gallon
Recommended Trowel:	1/16" wide x 1/32" deep x 1/32" apart Trowel blade adapter included
Grout:	UnderFlor® Premixed sanded acrylic grout
Grout Joint Width and Spread Ratio:	1/16" - 450 sq. ft. per gallon 1/8" – 325 sq. ft. per gallon 3/16" – 275 sq. ft. per gallon 1/4" – 225 sq. ft. per gallon
Suggested Usage: Light Commercial	Yes
Private Residential	Yes
Finished product manufactured in the United States	

Mold Resistant | **Humidity and Sag Resistant** | **Easy to Clean & Maintain**

ID381 Design Technology III Spring 2021, Assistant Professor Ethan Lu

Student Names: Tajahanae Aiken, Caleigh McLoughlin, and Manni Wu

be ex building energy exchange

Steven Winter Associates, Inc.

Building Performance: Acoustical & Durable Material Properties Explored

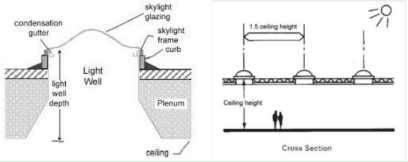
FIT Interior Design Department
Fashion Institute of Technology
State University of New York

DAYLIGHTING ELEMENTS: SKYLIGHT

Skylight: A skylight is a light-transmitting structure that forms all or part of the roof space of a building for daylighting purposes.

Benefits

- Adding natural light (and solar heating) to the spaces
- Letting in fresh air and better ventilation
- Saving on **energy costs** (electric and heating)
- Aesthetic changes add to the resale value
- Natural views and "adding space" to a room



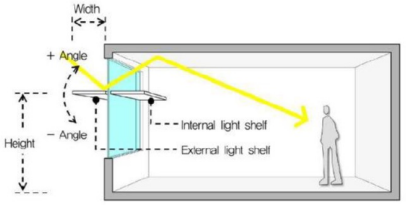
https://www.flynnroofing.com/2018/06/24/pros-and-cons-of-having-skylights-installed-in-your-home/

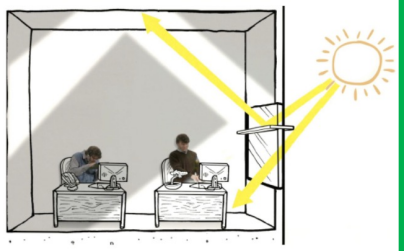
DAYLIGHTING ELEMENTS: LIGHT SHELVES

Light Shelves:A light shelf is a horizontal surface that reflects daylight deep into a building. Light shelves are placed above eye-level and have high-reflectance upper surfaces, which reflect daylight onto the ceiling and deeper into the space

Benefits

- Provides a strong amount of daylight within the rest of the interior allowing light to penetrate the space up to 2.5 to 4 times the distance between the floor and the top of the window.
- admissible for the LEED point system, falling under the "Indoor Environment Quality: Daylight & Views" category.
- Increases productivity within the interior
- Reflects light deeper into a space so the use of incandescent and fluorescent lighting can be reduced which reduces the need for artificial lighting in buildings.





https://www.c-sgroup.com/sun-controls/daylight-systems
https://www.designingbuildings.co.uk/wiki/Light_shelf

CLIMATE CONTROL: UNDERFLOOR AIR DISTRIBUTION SYSTEM

Underfloor air distribution system (UFAD): These are air distribution strategies that provide ventilation and space conditioning in buildings. They are used with raised access flooring to distribute conditioned air as part of the HVAC system.

Benefits

- Improve employee productivity and health
- Diffusers installed in a raised floor can be reconfigured/adaptable to fit the space
- Offer better air quality
- Increase occupant comfort and satisfaction
- Easy installation without having to change the interior layout
- Reduce operational costs (energy saving)

The FlexSys modular integrated terminal unit allows the lowest access floor height of any underfloor air distribution system, to as low as six inches.

The FlexSys design provides easy access for utility service infrastructure and cabling during and after construction.

With the FlexSys system, the entire area under the floor becomes a low-pressure air plenum. FlexSys distributes air through an advanced air terminal design known as the modular integrated terminal. The fully integrated damper and actuator motor silently supplies cooling or heating to the space, ensuring consistent temperature control. This digital technology also allows the system to react very quickly to changes in load, opening and closing in one second, for desired comfort levels.

https://www.johnsoncontrols.com/-/media/jci/be/united-states/airside-systems/under-floor-air-distribution/files/be_prod_airsystems_underfloorairdistribution_flexsys_overview.pdf

Skylight | **Light Shelves** | **Underfloor Air**

INDOOR AIR QUALITY: THE GREEN WALL

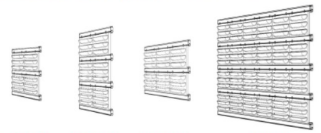
Green wall: A green wall system provides the interior space a breath of fresh air. It will improve the air quality while also providing acoustical properties to the space. LivePanel PACK is a modular green wall system that can be easily installed.

Benefits

- Healthy, working environment
- Flexible, space-saving green wall system with an unlimited range of applications
- Increase productivity and creativity

Features

- Fully recyclable
- Exchangeable plant cassettes for a dynamic view
- A water supply to last 1-2 weeks
- Works without electricity, water connection, water drainage or irrigation system
- Short installation time
- Smart and silent water level indicators



https://mobilane.com/app/uploads/2021/01/A4-Factsheet-LivePanel-PACK-UK-without-print-marks.pdf
https://mobilane.com/app/uploads/2020/06/Installation-Manual-LivePanel-PACK-6-x-4.pdf

INDOOR AIR QUALITY: HEPA AIR FILTRATION

HEPA air filtration (High Efficiency Particulate Air): It is a filter that is designed to prevent the spread of airborne radioactive contaminants. The filters are there to help clean the air especially for those who have dust or pollen allergies. ALEN's advanced particle sensor technology will provide the status of the air quality in the space with LED color rings showing on the BreatheSmart 75i.

Benefits

- Improve air quality
- Removes 99.99% of particles greater than 0.1 microns
- Air purifiers draw air in using a series of fans, then condition the air in some fashion, and finally blows the air back out into the room

Features

- Noise Level: Lowest Speed 25 dBa | Highest Speed 49 dBa
- Power Consumption: 1.8 to 45 watts
- Speed Setting: 5
- Covers up to 1,300 sq. ft. (120.77 m2) & cleans all air quality in the room every 30 minutes at the highest setting

https://alen.com/products/alen-breathesmart-75i-air-purifier?variant=13172054491203

FRESH AIR EXCHANGE: CO_2 MONITORING

Carbon dioxide: Carbon dioxide is a colorless and non-flammable gas at normal temperature and pressure. Although much less abundant than nitrogen and oxygen in the Earth's atmosphere, **carbon dioxide** is an important constituent of our planet's air.

CO2 monitor: **Carbon dioxide** (CO_2) monitors measure gas concentration, or partial pressure, using one of two configurations: mainstream or sidestream.

Benefits/Key Features

- Monitors the levels of carbon dioxide in any environment and alert whomever.
- True volume % readout over a wide range of pressures (pressure compensated)
- Graphic screen display provides more information Digital Alarm set points
- The Guardian NG range of infrared gas monitors offer near-analyser quality continuous sampling, measurement and display of target gas concentrations

The Guardian NG wall mounted monitor

https://edinburghsensors.com/co%E2%82%82-monitoring-for-indoor-air-quality/
https://edinburghsensors.com/products/gas-monitors/gas-monitor-guardian-ng/

Green Wall | **HEPA Air Filtration** | **CO2 Monitoring**

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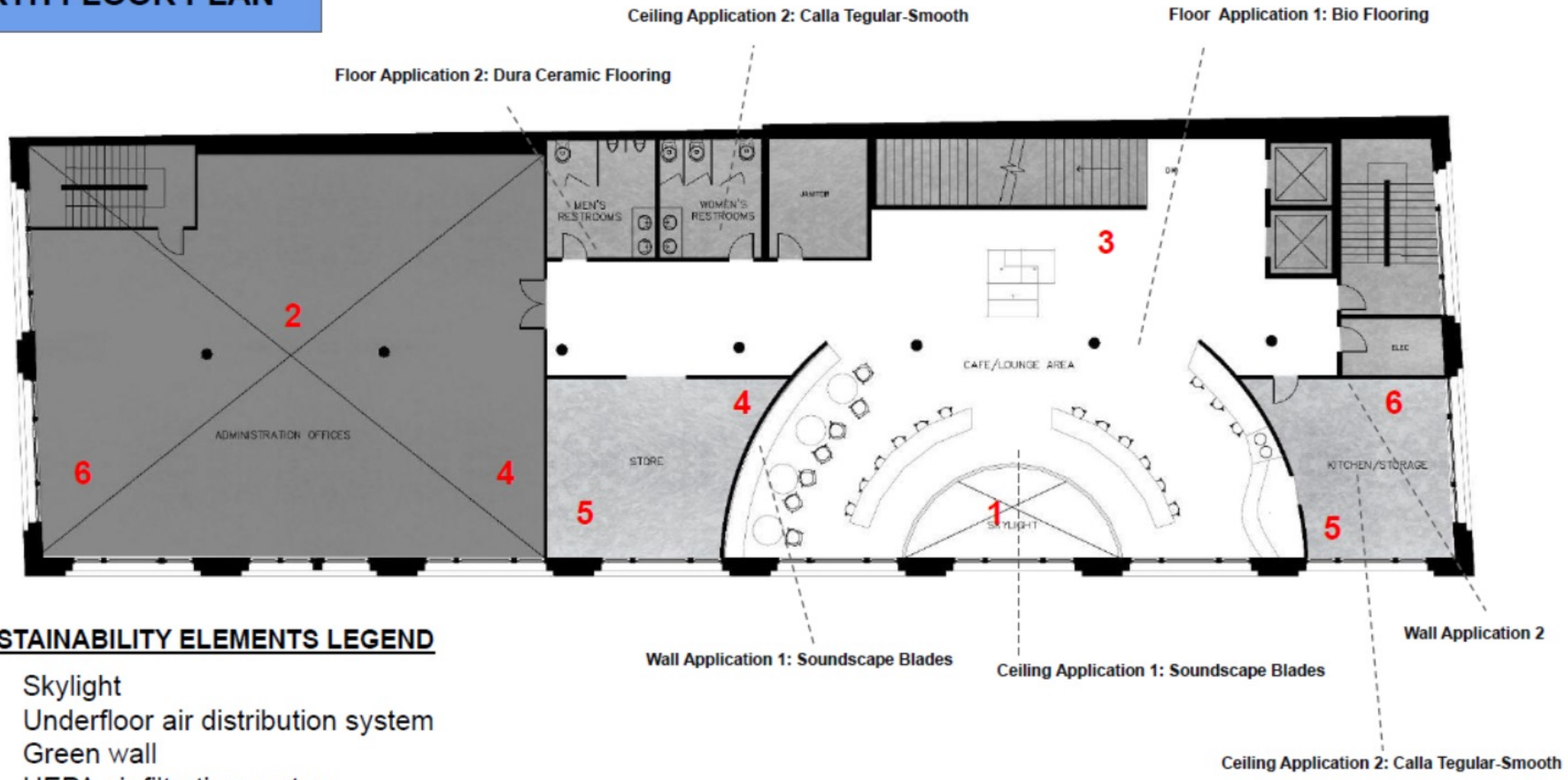
Steven Winter Associates, Inc.

Building Performance: Wellness Equity

FIT Interior Design Department Fashion Institute of Technology State University of New York

FOURTH FLOOR PLAN



SUSTAINABILITY ELEMENTS LEGEND

1. Skylight
2. Underfloor air distribution system
3. Green wall
4. HEPA air filtration system
5. Light shelves
6. CO2 Monitoring

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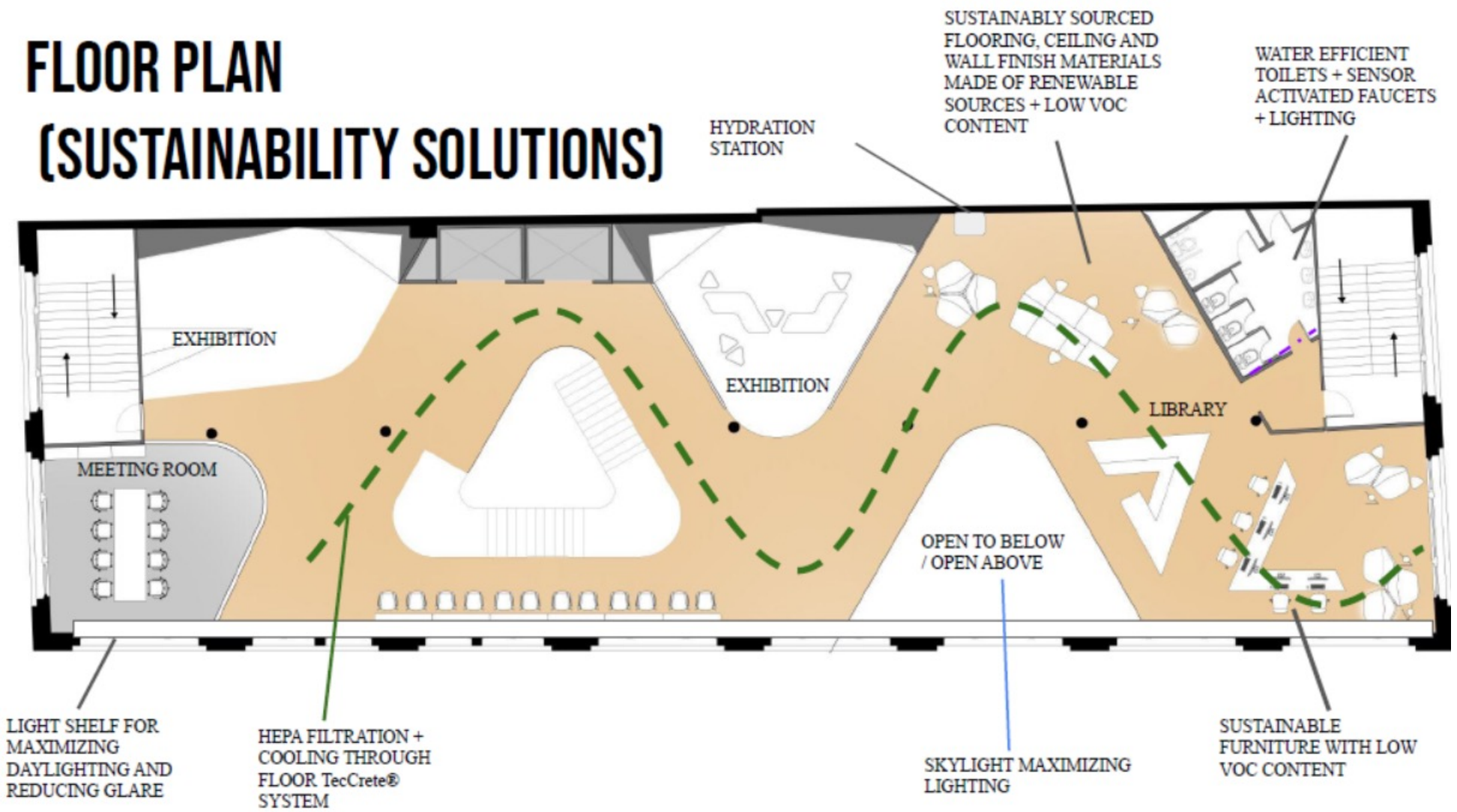
Building Performance: Creating Integration Opportunities

FIT Interior Design Department Fashion Institute of Technology State University of New York

FLOOR PLAN (SUSTAINABILITY SOLUTIONS)



WELLNESS + WATER QUALITY

DAYLIGHTING

BrightShelf— Light shelves

ID381 Design Technology III Spring 2021, Assistant Professor Ethan Lu

Student Names: Aliana-Mia Torres, Joanna Bak Plummer, and Yewon Seo

building energy exchange

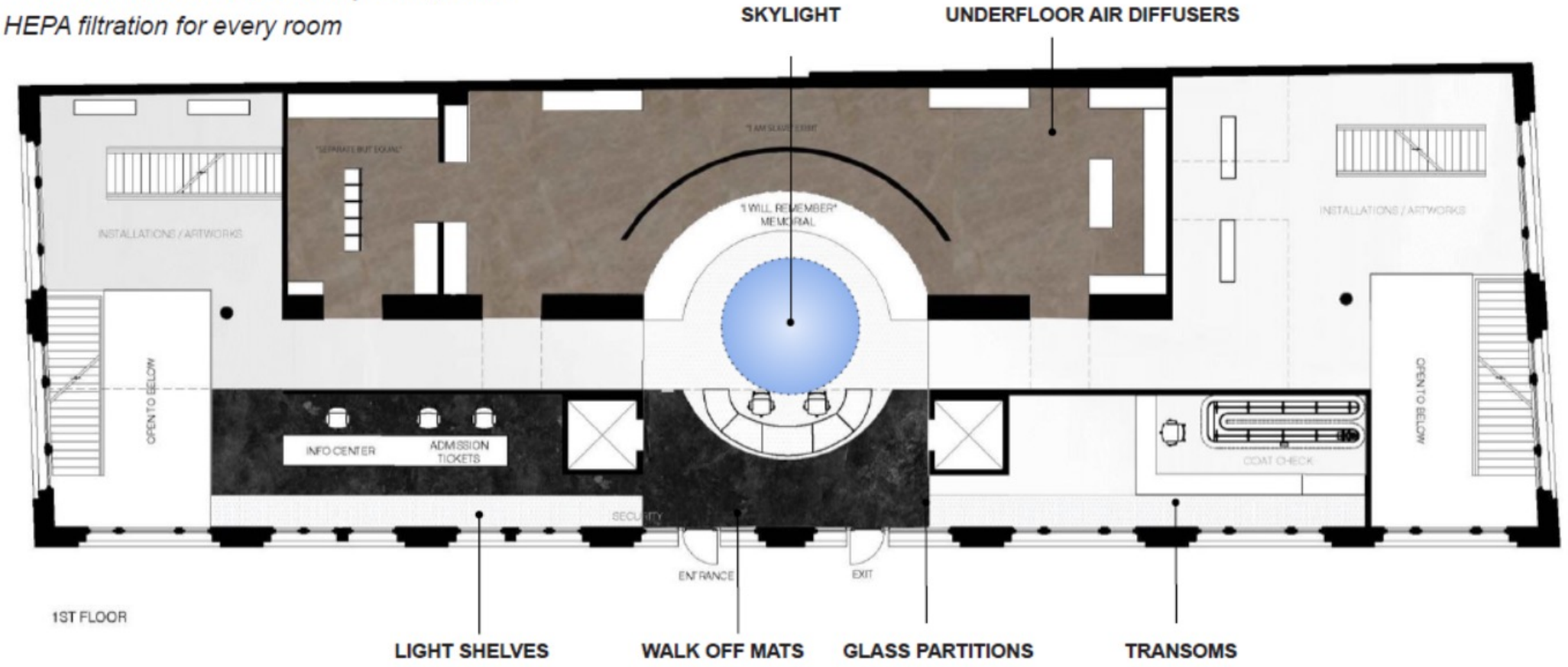
Steven Winter Associates, Inc.

Building Performance:
Creating Integration Opportunities

Interior Design Department
Fashion Institute of Technology
State University of New York

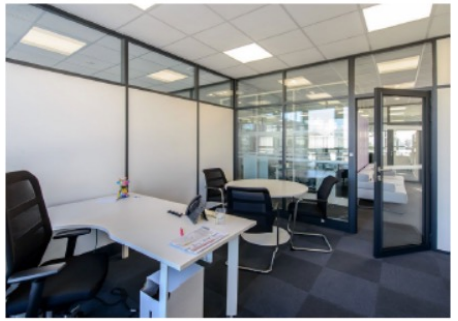
SUSTAINABILITY PLAN LOCATORS

***NOTES:** CO2 sensors in every room, UFAD*
HEPA filtration for every room



WALK OFF MATS

Daylighting Solution **- TRANSOMS**



ID381 Design Technology III Spring 2021, Assistant Professor Ethan Lu

Student Names: Mirel Leider, Iryna Varonina, and Noa Telem

be ex building energy exchange

Steven Winter Associates, Inc.

Building Performance: Creating Integration Opportunities

FIT Interior Design Department Fashion Institute of Technology State University of New York

CONCLUSION

In conclusion, we have achieved the goal of our concept by creating a welcoming environment for the Black Lives Matter movement. Thinking about occupancy, activities, and wellness, we made intentional decisions to best meet the expectations of the client while creating a practical and maintainable environment. The project is successful in considering each space through a visually appealing color scheme, and sustainable materials for wall and ceiling details that cater to acoustical and wellness design.

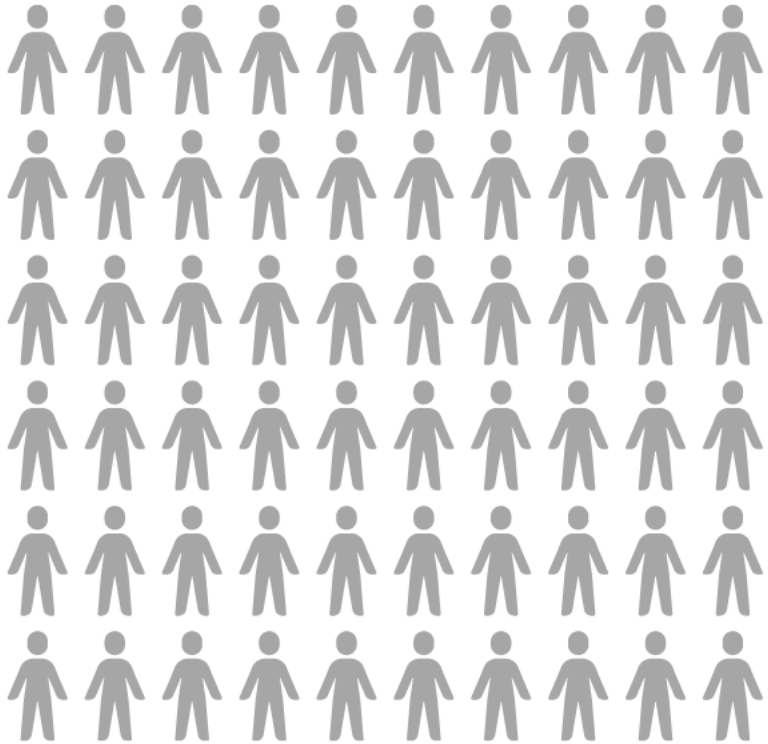
Advancing Inclusive Design: Operationalizing Equity in the Built Environment

Victoria Lanteigne, MPP, WELL AP

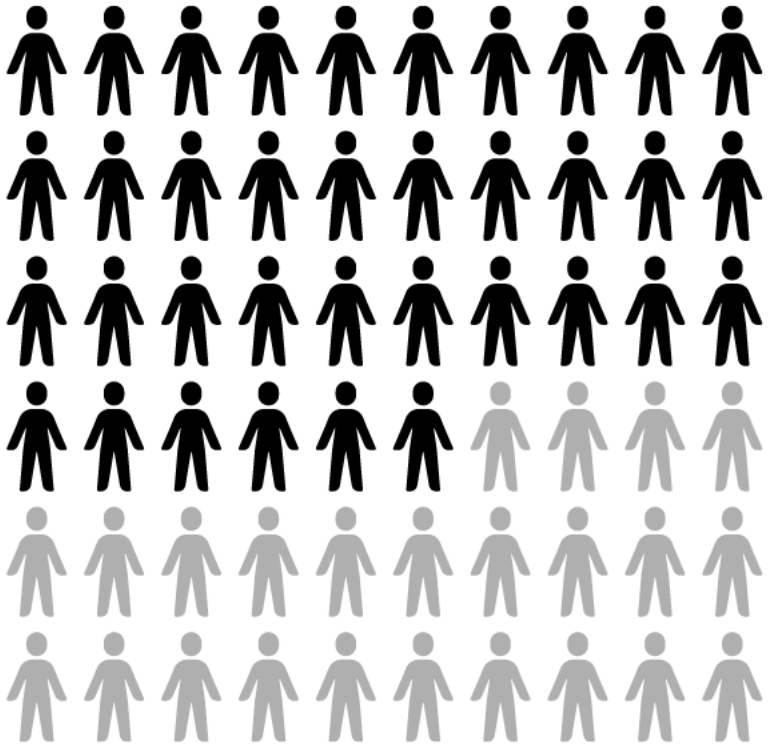
Inclusive Design Consultant, Ph.D. Student

NC STATE UNIVERSITY
College of Design

Inclusive Design for All?



Inclusive Design for All?



With core goals of **accessibility** and **usability**, target populations for Inclusive Design have traditionally been people with disabilities and aging populations.

(Steinfeld and Maisel, 2012)

Demographic Groups Addressed Across Inclusive/Universal Design Resources

Inclusive/Universal Design Resource	Country	Type	Disability				Age	Gender	LGBTQ+	Race
			Mobility	Hearing/ Visual	Cognitive	Mental Health				
Enterprise Green Communities 2020: Beyond ADA: Universal Design (EGC, 2020)	US	Building Rating Standard	●	●	●	●	●	●		
Innovative Solutions for Universal Design (isUD) (IDEA Center, 2020)	US	Building Rating Standard	●	●	●		●	●	●	
LEEDv4 Inclusive Design Pilot Credit (USGBC, 2019)	US	Building Rating Standard	●	●	●	●	●	●		
WELLv2: Feature C13: Accessibility and Universal Design (IWBI, n.d.)	US	Building Rating Standard	●	●	●				●	
Building for Everyone: A Universal Design Approach (Centre for Excellence in Universal Design, n.d.)	Ireland	Practitioner Guidelines	●	●	●	●	●			
New Zealand Buildings for Everyone: Designing for Access and Usability (New Zealand, n.d.)	New Zealand	Practitioner Guidelines	●	●	●		●			
Universal Design Guidelines, Version 2.0 (Center for Universal Design, 1997)	US	Practitioner Guidelines	●	●	●					
Universal Design Handbook: Building Accessible and Inclusive Environments (Calgary, 2010)	Canada	Practitioner Guidelines	●	●	●		●			
Universal Design New York (UDNY) 2 (IDEA Center, 2003)	US	Practitioner Guidelines	●	●	●	●	●	●		
Universal Design: A Manual of Practical Guidance for Architects (Goldsmith, 2000)	US	Textbook	●	●	●		●	●		
Universal Design: Creating Inclusive Environments (Steinfeld & Maisel, 2012)	US	Textbook	●	●	●	●	●		●	
Universal Design Handbook, 2nd Edition (Preiser & Smith, 2011)	US	Textbook	●	●	●	●	●			
Universal Design Principles and Models (Null, 2014)	US	Textbook	●	●	●		●	●		
Universal Design: Solutions for Barrier-free Living (Herwig, 2008)	US	Textbook	●	●	●		●			

Figure 1. Inclusive/Universal Design Resource review of demographic groups based on CDC report of most vulnerable populations (CDC, 2016).

Barriers in the Built Environment

- **Physical and spatial barriers** exist in the built environment to disparately impact building occupants based on their race, sexual orientation, gender, disability status, and other individual and intersectional identities.

(Azzouz & Catterall, 2021; Delany, 2010; Doan, 2015, Neely & Samura, 2011, Pérez, 2020)

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- Different experiences of the built environment can be interpreted as **an issue of equity** when the outcomes negatively and disparately affect marginalized groups.

- How are we addressing **equity in the built environment** as an industry?

(Azzouz & Catterall, 2021; Delany, 2010; Doan, 2015, Neely & Samura, 2011, Pérez, 2020)

Equity Resource Review

Resource	Equity Standard
Enterprise Green 2020 Standards	Integrative Design, Neighborhood Fabric, Health
Design Justice Principles	Full Framework
Fitwel	Social Equity for Vulnerable Populations
Just. User Manual 2.0	Full Framework
Justice in the Built Environment: AIA Guides for Equitable Practice	Full Framework
LEED v4.1 BD+ C	Pilot Credits
LEED v4. Social Equity Pilot Credits	Full Framework
LEED Social Equity in Pandemic Planning	Full Framework
Living Building Challenge	Living Future Equity Petal
RELi 2.0	Community Cohesion, Social + Economic Vitality
WELL v2 Building Standard	Community Concept
WELL Health Equity Rating	Full Framework

Equity Approaches and Gaps

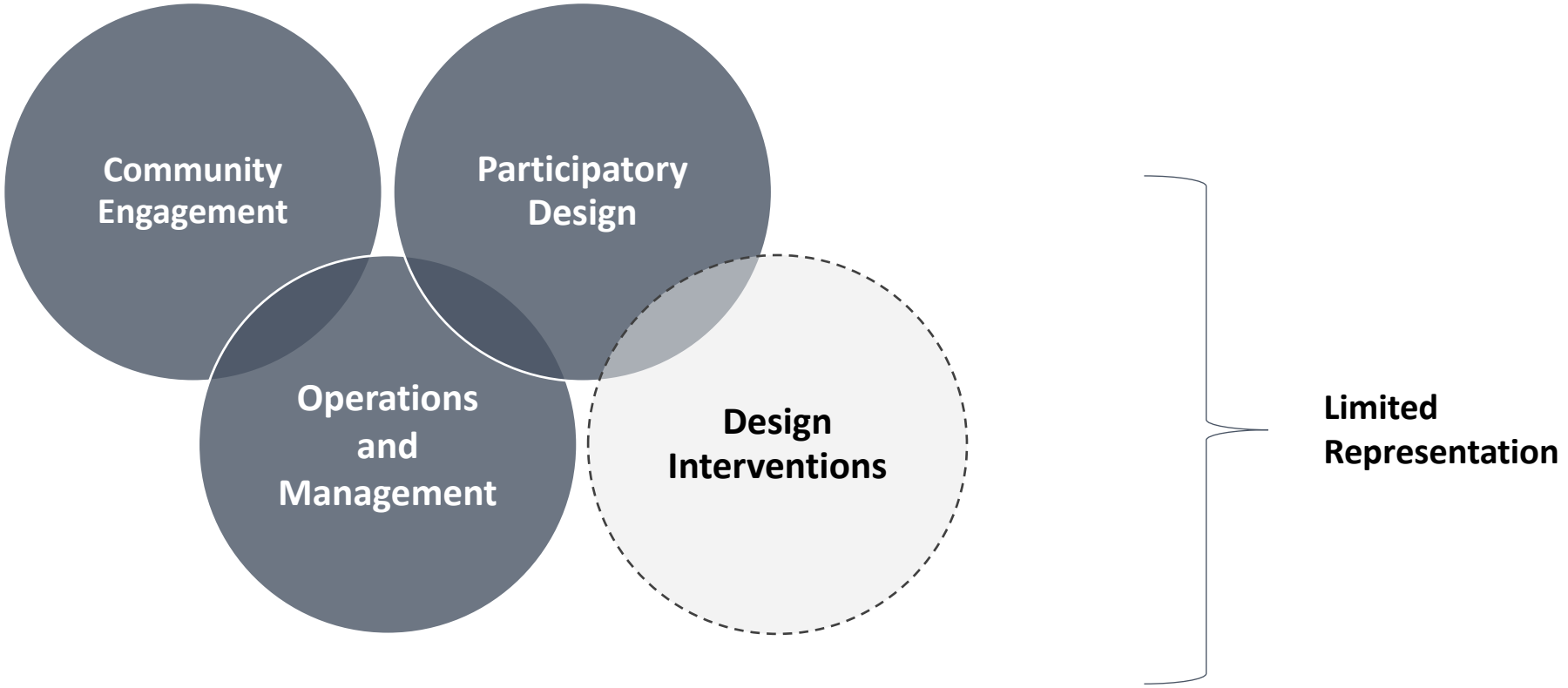
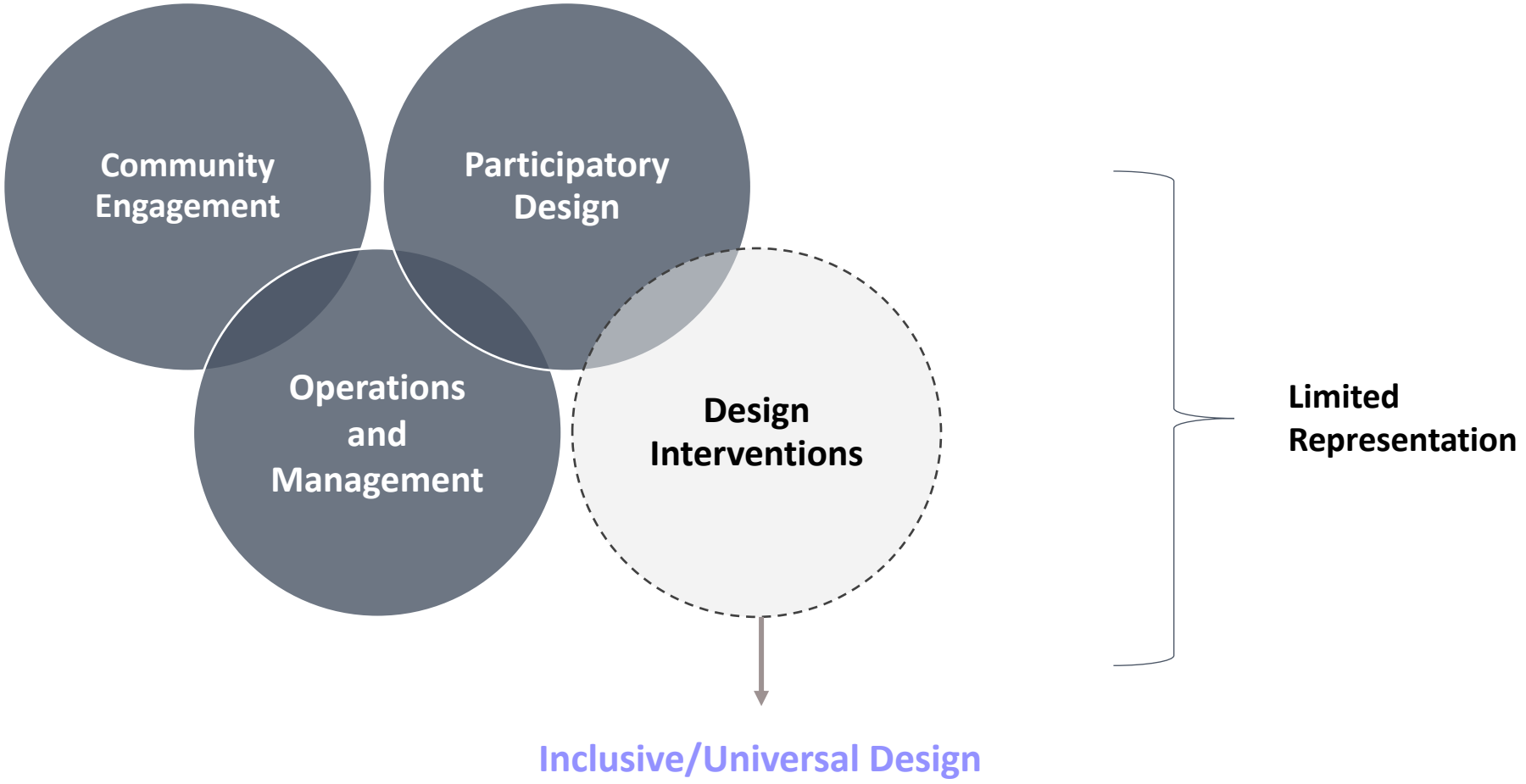


Figure 2. Equity approaches and key gaps in design interventions for race, gender, and LGBTQ+ inclusion.

Equity Approaches and Gaps



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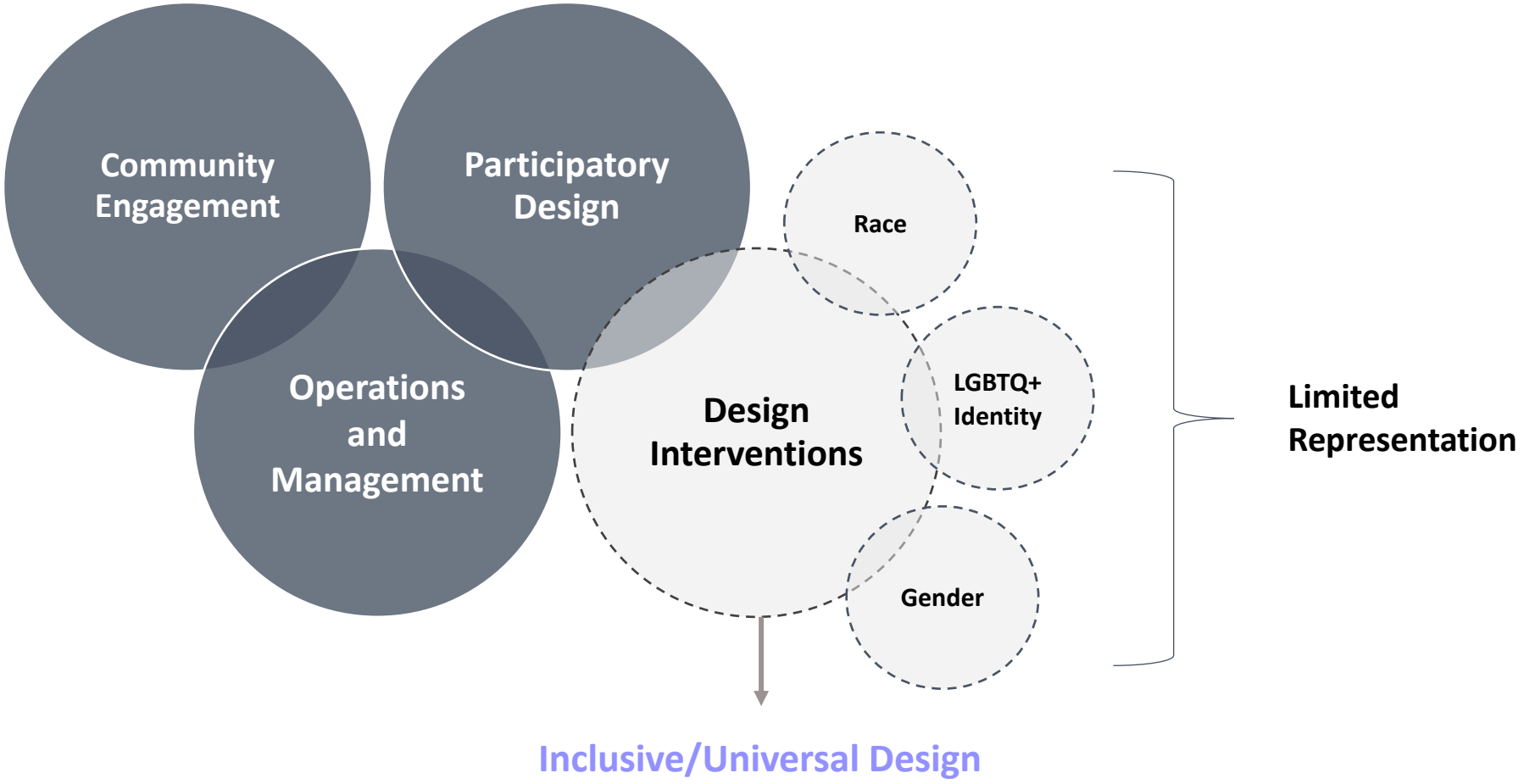
Equity Approaches and Gaps



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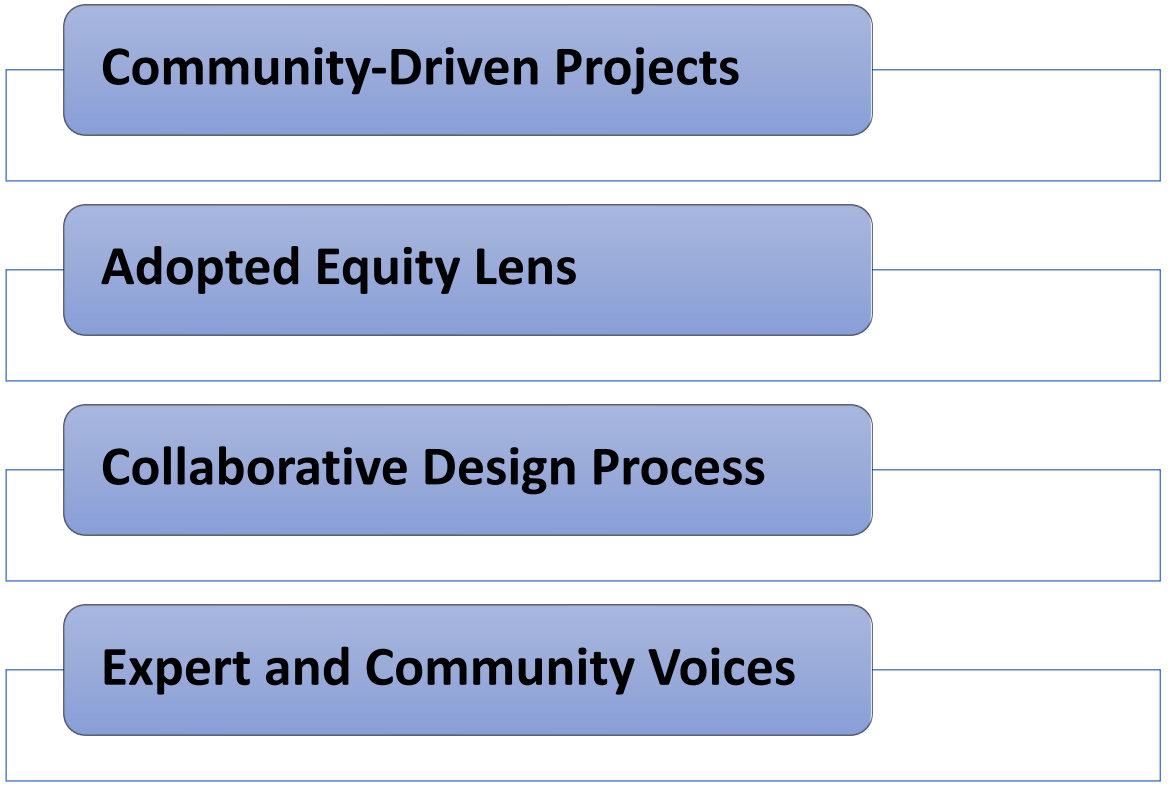
Case Study Research

Qualitative case study research to explore **how equity is operationalized** in the built environment of real-world projects.



Community and Practitioner Research Partners

Harvey Milk Plaza Memorial
San Francisco, CA

The Friends of Harvey Milk +
SWA Group

The Women's Building
New York, NY

The Novo Foundation +
Deborah Berke Architects

Norman-Sims Elementary
East Austin, TX

Norman-Sims Elementary +
Kirksey Architects

The Wing Luke Museum of the Asian Pacific American Experience
Seattle, WA
Wing Luke Museum +
SKL Architects

Conceptual Framework

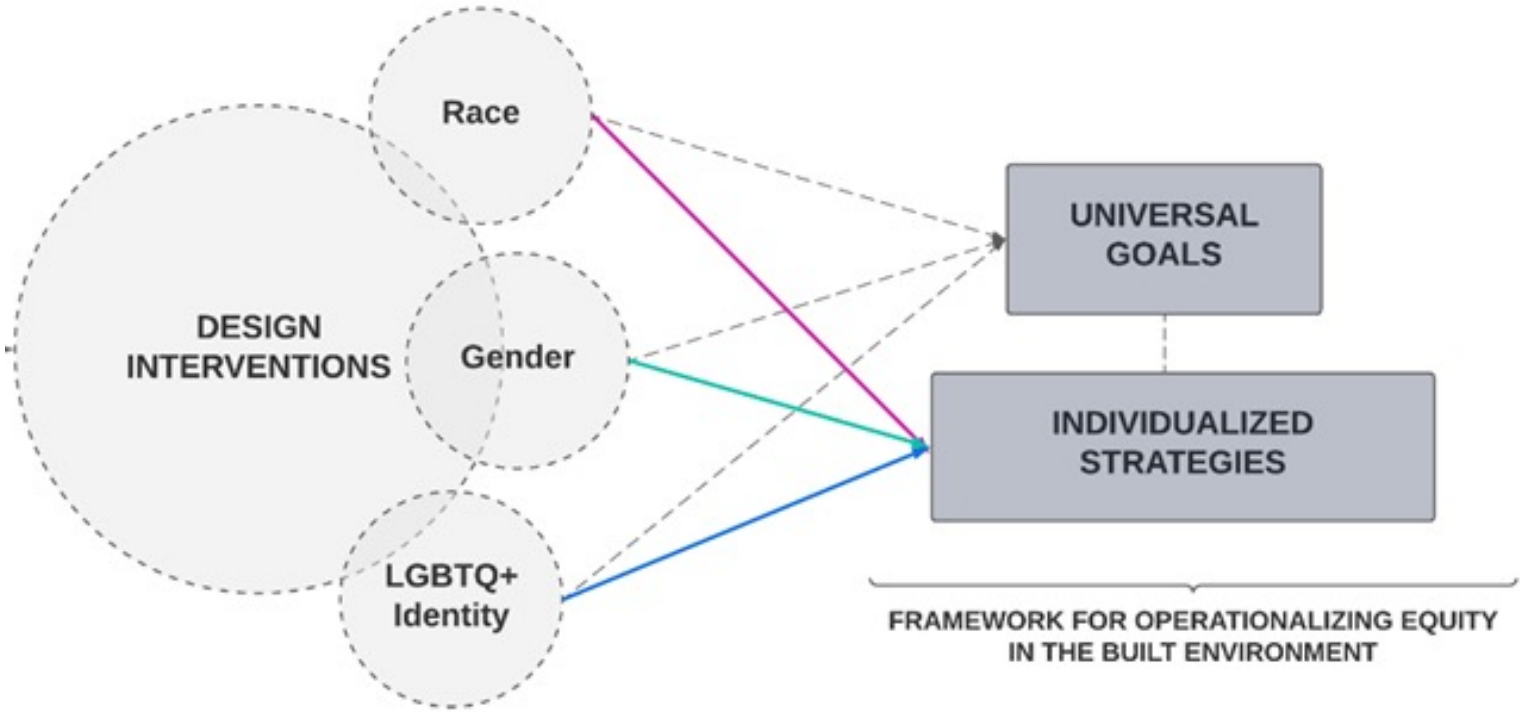


Figure 3. Conceptual framework for research study that aims to operationalize equity in the built environment.

Future Steps

- Develop a **Design Equity Framework** that can be tested and built upon through future research.
- Inform **future design standards**, guidelines, and policies.
- Continued research on **design equity i**n the context of the built environment.

Thank You

Victoria Lanteigne | vlantei@ncsu.edu

Inclusive Design and Building Performance

Exploring Synergies with Equity, Sustainability, and Health