

October 24th, 2025

West Lakes Regional Conference

Milwaukee, Wisconsin

THE UNEVEN GEOGRAPHY OF OUTDOOR DINING: IMPLICATIONS FOR PEDESTRIAN SPACES

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spatial pattern analysis and research

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WHY OUTDOOR DINING MATTERS

- 📍 Pandemic Origins → Double-edge sword (Brody et al., 2025)
- 📍 Links to vitality: “positive interaction between people and space” (Chen, 2022).
- 📍 Gap: equity of distribution largely unstudied



RELATED WORK

- Temporary urban structures → increase pedestrian activity (Paukaeva et al., 2021; Batista & Friedrich, 2022).
- Sidewalk planimetric data as new resource (Hosseini et al., 2021; Lieu & Guhathakurta, 2025).



RESEARCH GOALS

- 📍 How are outdoor dining spaces distributed across neighborhoods of differing income and racial composition, and what does this reveal about equity in the public realm?
- 📍 First to combine outdoor dining and sidewalk planimetrics and sociodemographic data

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DATA OVERVIEW

Data Name	Data Description	Data Type	Data Date	Data Source	Link to Source
Open Dining Locations	Open Dining Locations in NYC	Points	2025	Department of Transportation	https://services.arcgis.com/wmZOI9vyUBq1zTZx/arcgis/rest/services/NYC_Open_Restaurants_Application_v3_Dashboard_Only/FeatureServer
Planimetric Sidewalks	Sidewalk Widths	Polygons	2024	NYC Open Data (Amelia Harvey)	https://opendata.cityofnewyork.us/projects/sidewalk-widths-nyc/
NYC Blocks	B19013_001: Median Income B02001_002: Percentage Population White B01003_001: Total Population	Polygons	2024	US Census Bureau	Downloaded using R package: “tidycensus”

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- Filter → sidewalk/both locations only.
- Density = dining points per 1000 square feet of sidewalk
- Stratification: by borough, income quartiles, percent white quartiles

MEASURING OUTDOOR DINING DENSITY

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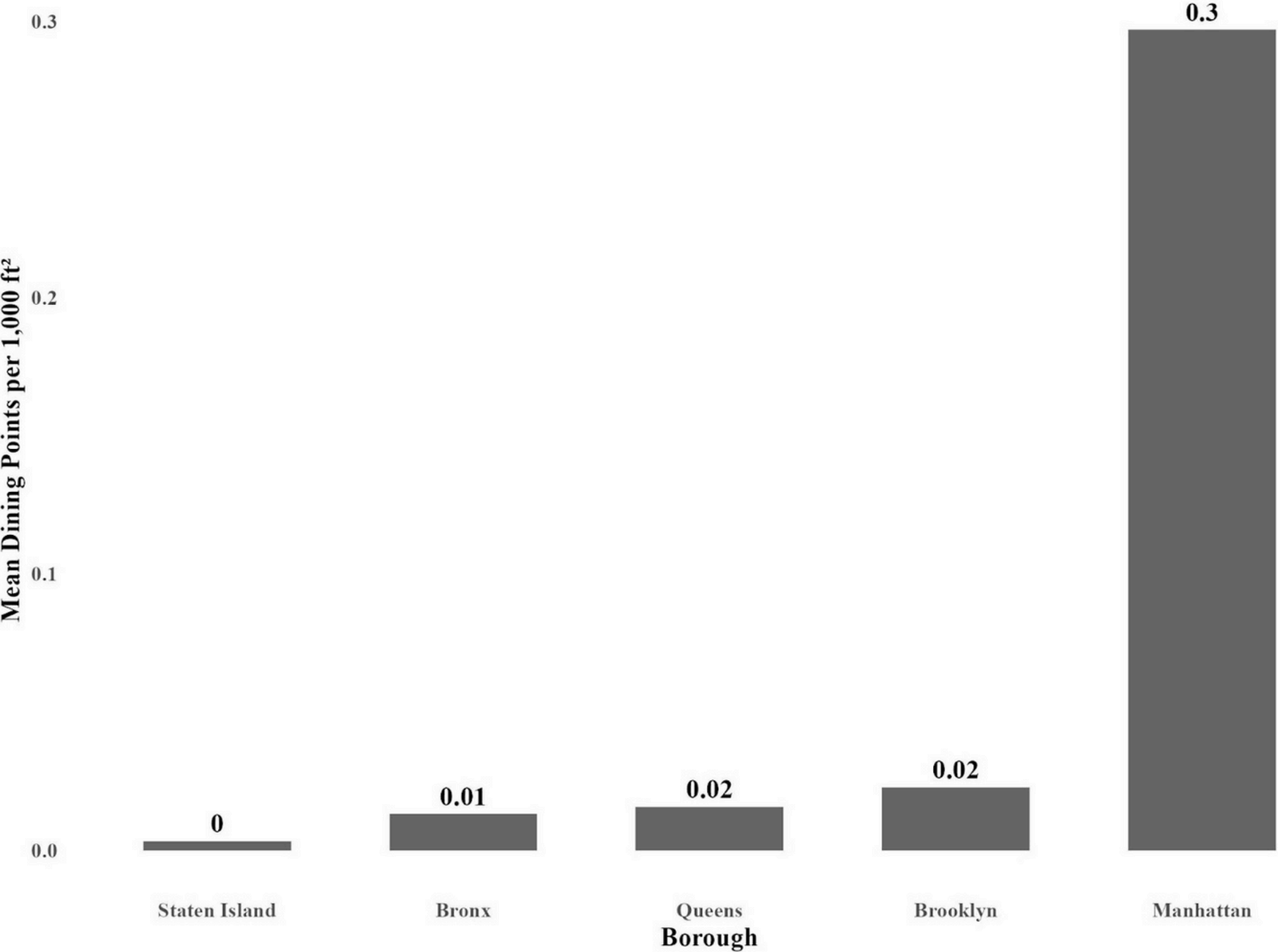
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- Equity gap measure:
Symmetric Relative Gap.
- Spatial autocorrelation:
Moran's I.
- Local clustering: Getis-
Ord G_i^* , composite, and
3-way hotspot maps

SPATIAL ANALYSIS

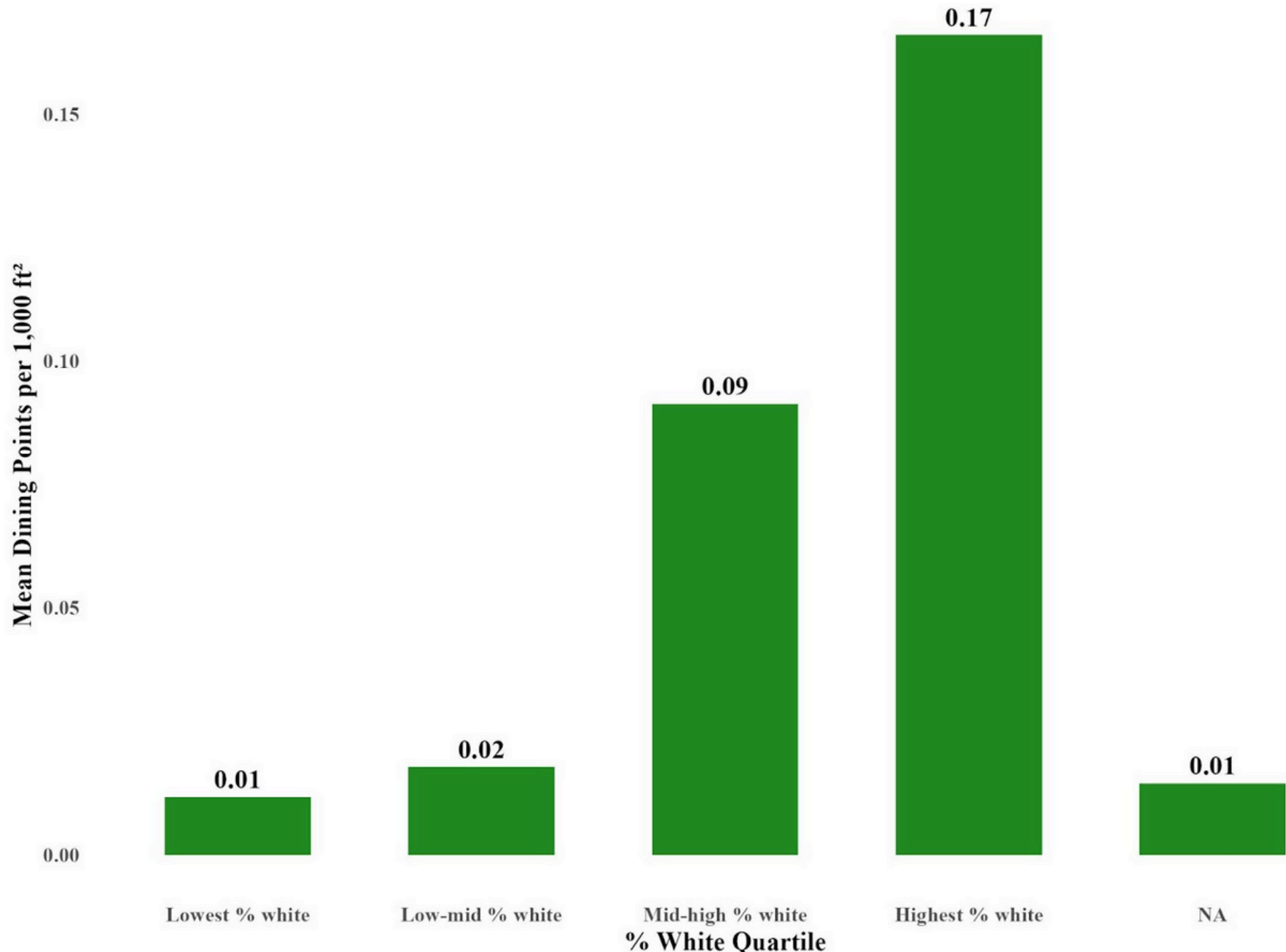
Average Dining Density by Borough



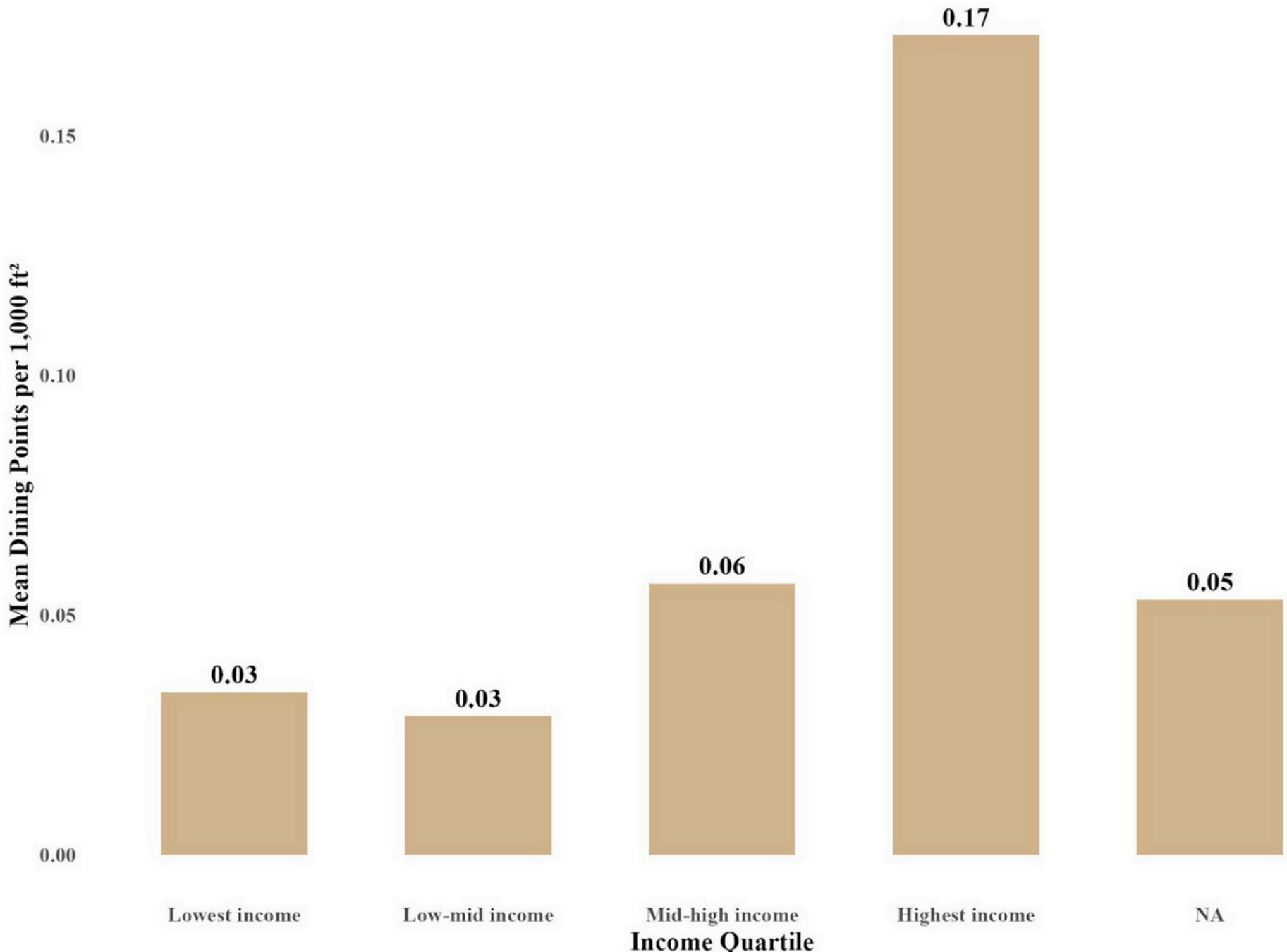
BOROUGH PATTERNS

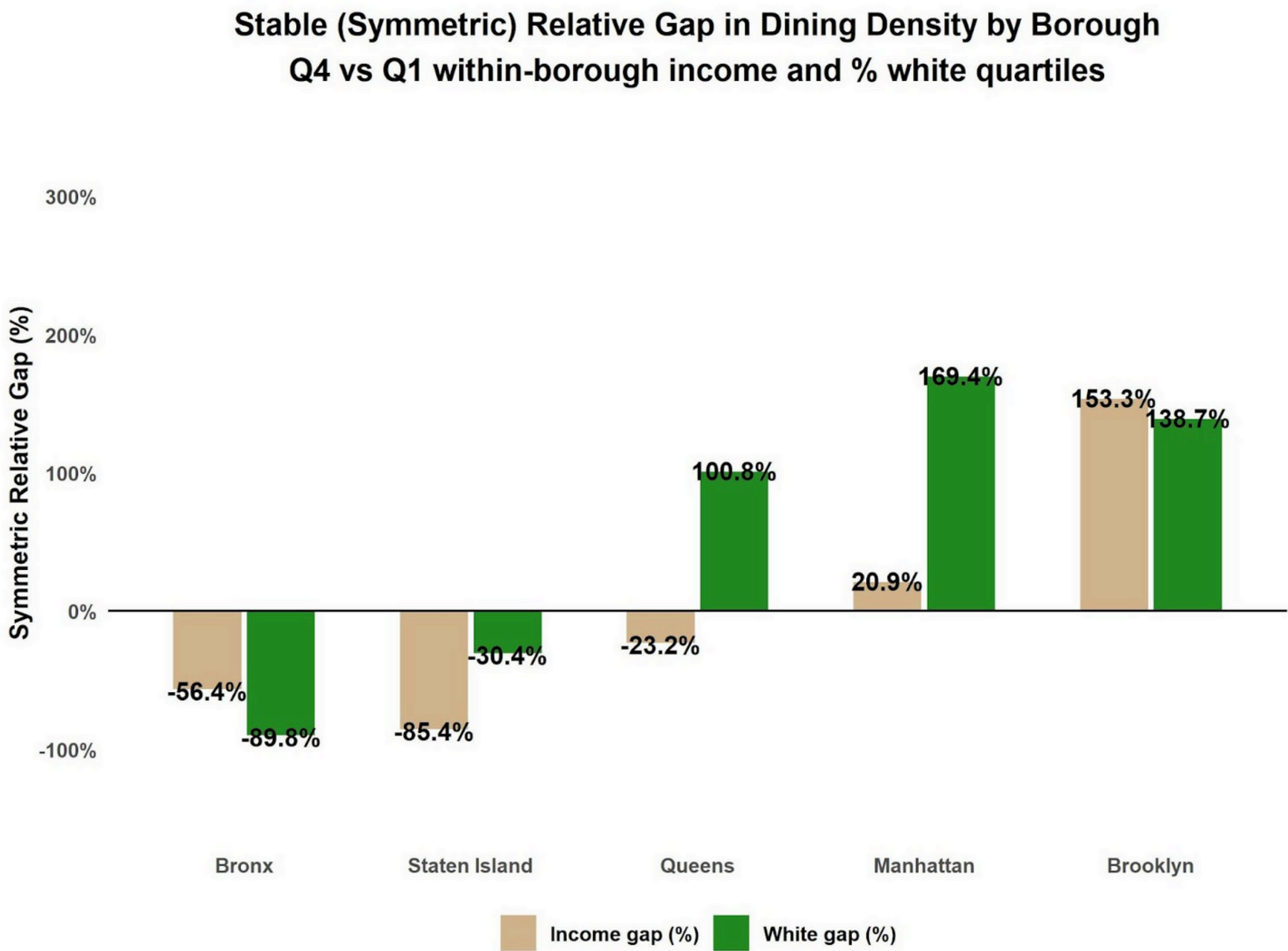
SOCIODEMOGRAPHIC TRENDS

Mean Dining Density by % White Quartile

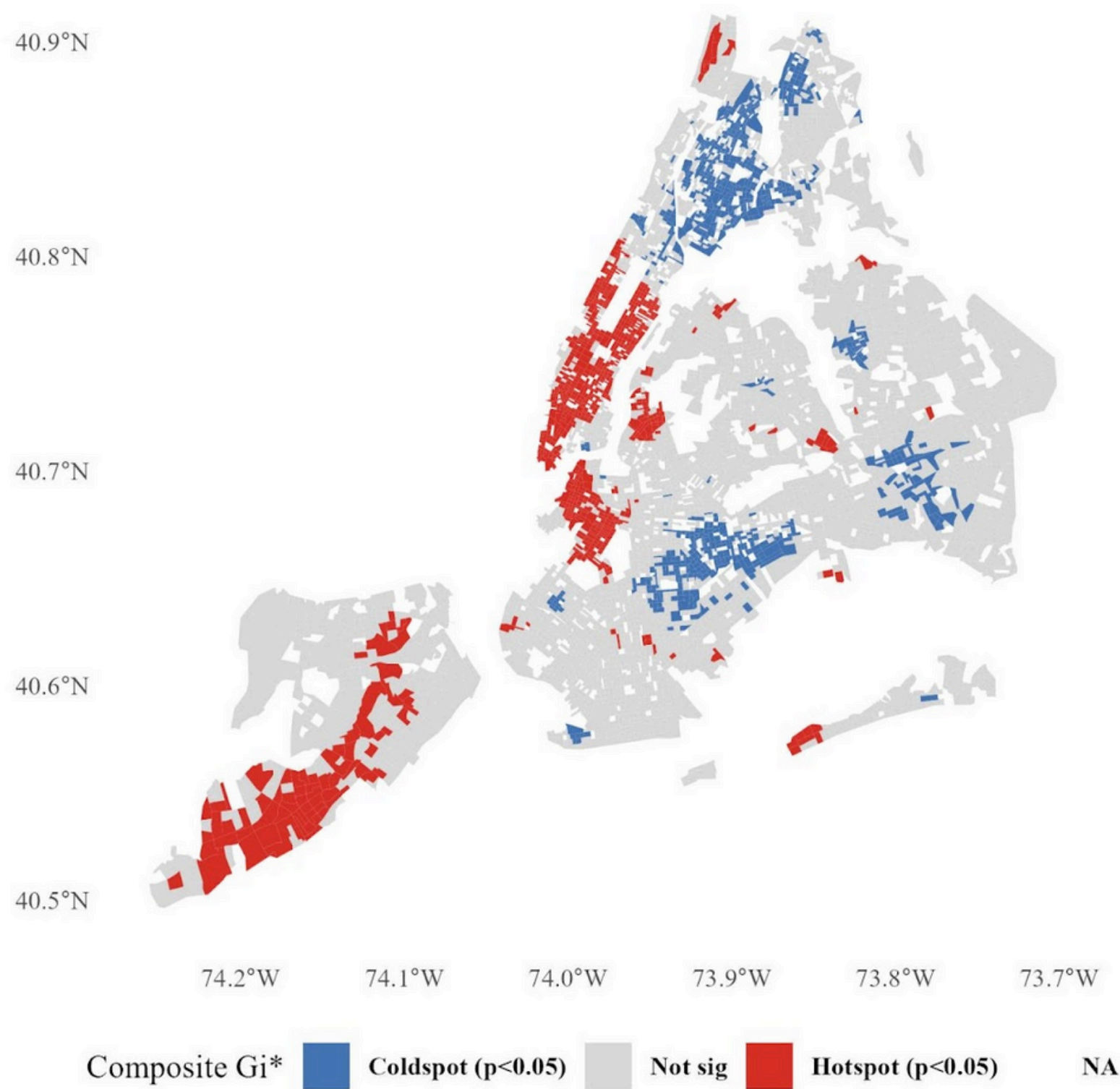


Mean Dining Density by Income Quartile





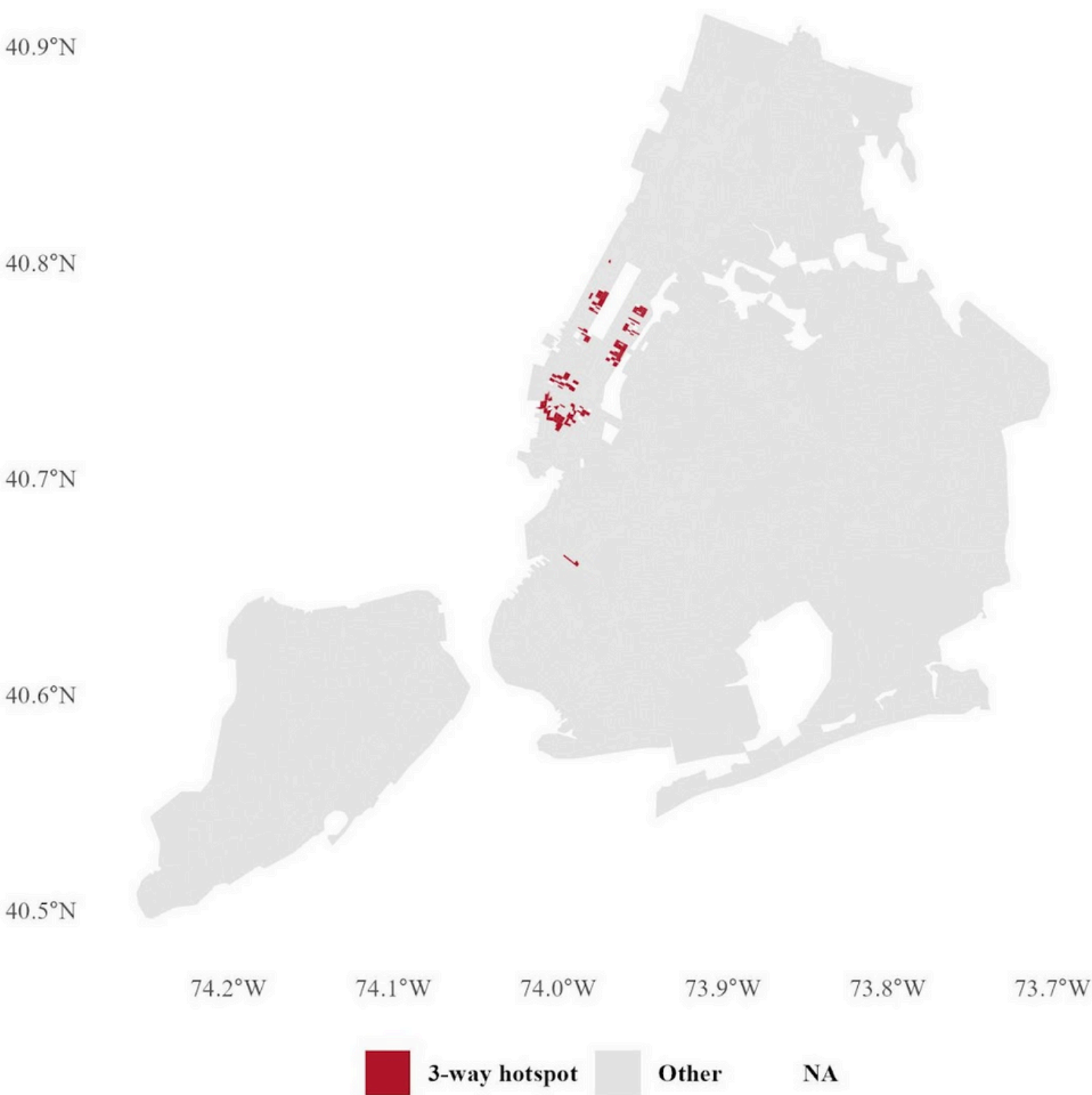
Composite Hotspots: Privileged Outdoor Dining
(z of Density, Income, % White)



HOTSPOT ANALYSES

Composite hotspots:
Manhattan and
waterfronts

3-Way Hotspots: High Dining + High Income + High % White (Gi* intersections)



HOTSPOT ANALYSES

Compact midtown-to-lower Manhattan

KEY INSIGHTS

• Outdoor dining increases pedestrian vitality but unevenly distributed.

• Spatial lines of advantage → wealthier, whiter areas coincide with higher concentrations

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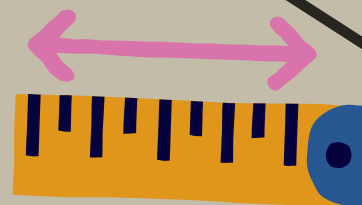
- Not casual but associations highlight program design issues.
- Sidewalks are contested spaces: conflicts with accessibility, delivery robots, competing uses.



EQUITY IMPLICATIONS

DISCUSSION

- Outdoor dining is now a permanent feature of NYC's pedestrian realm
- Distribution is uneven across boroughs and demographics.
- Open data and spatial analysis reveal clear inequities.
- Equity lens is critical: ensure benefits reach all communities



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BUT..
QUANTITY DOES NOT
EQUAL QUALITY

CURRENT RESEARCH

- But does ALL outdoor dining contribute equally?
- Next phase: Systematically measure quality differences across outdoor dining infrastructure
- Goal: Move from quantity-based policies to quality-based frameworks

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- Train team of 3–5 researchers to conduct systematic audits via Google Street View
- Stratified sampling: Restaurants across all 5 boroughs by:
 - Income quartile
 - Racial demographics (% white quartile)
 - Geographic distribution

SCALING OBSERVATIONS THROUGH AUDITS

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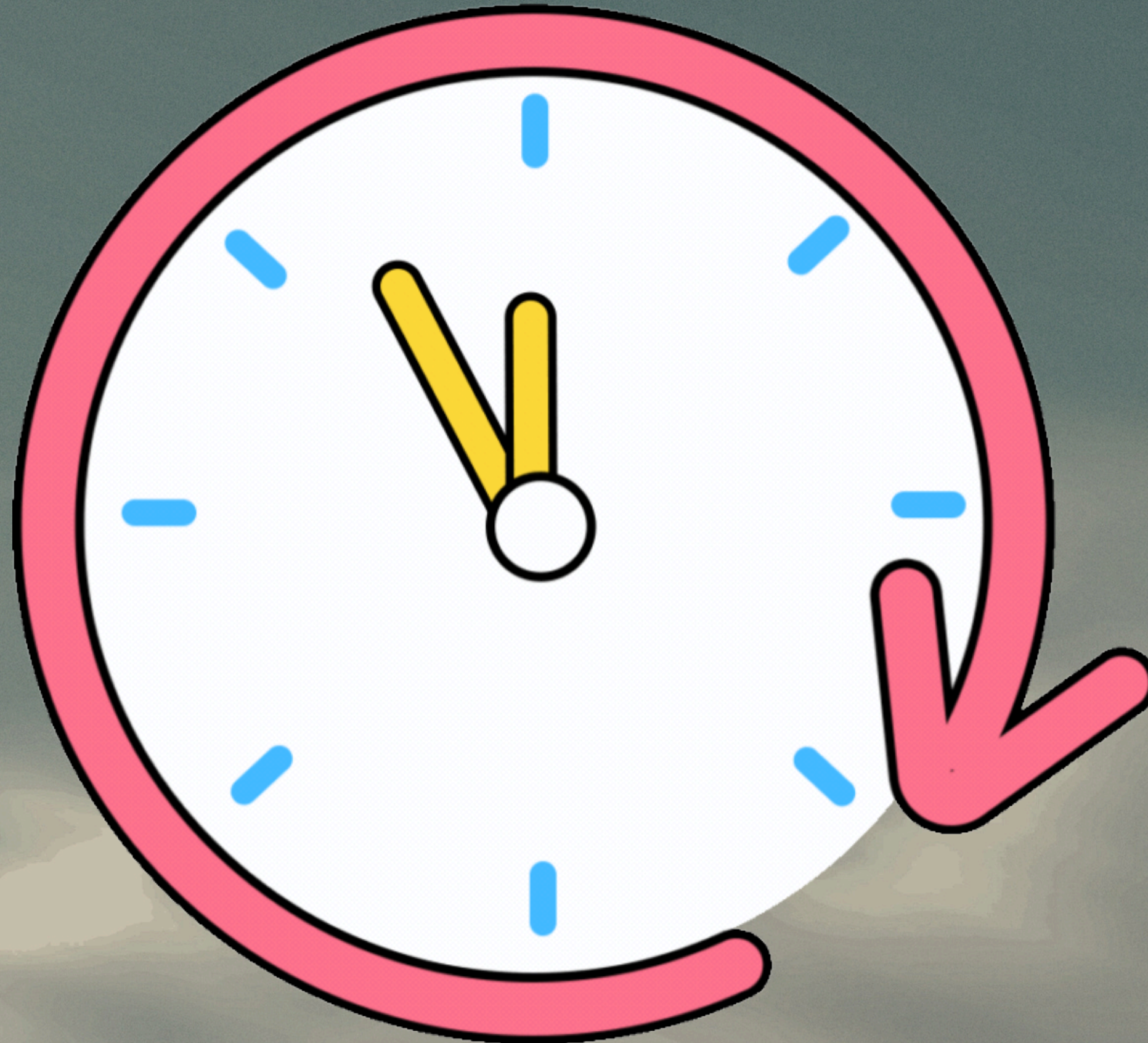
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FROM PRESENCE TO QUALITY...

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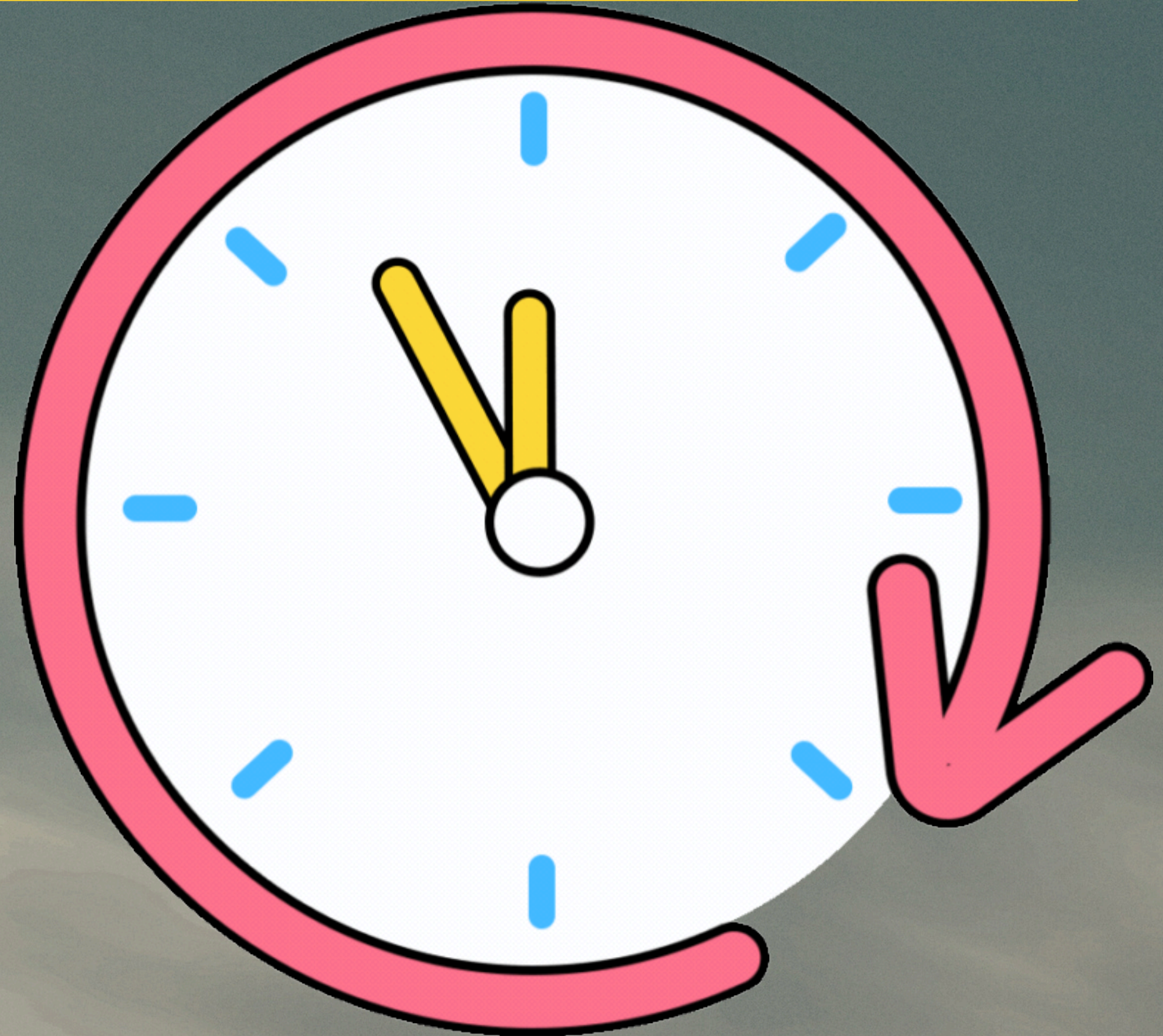


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WE ALL WERE HIRED AS MILWAUKEE URBAN PLANNERS



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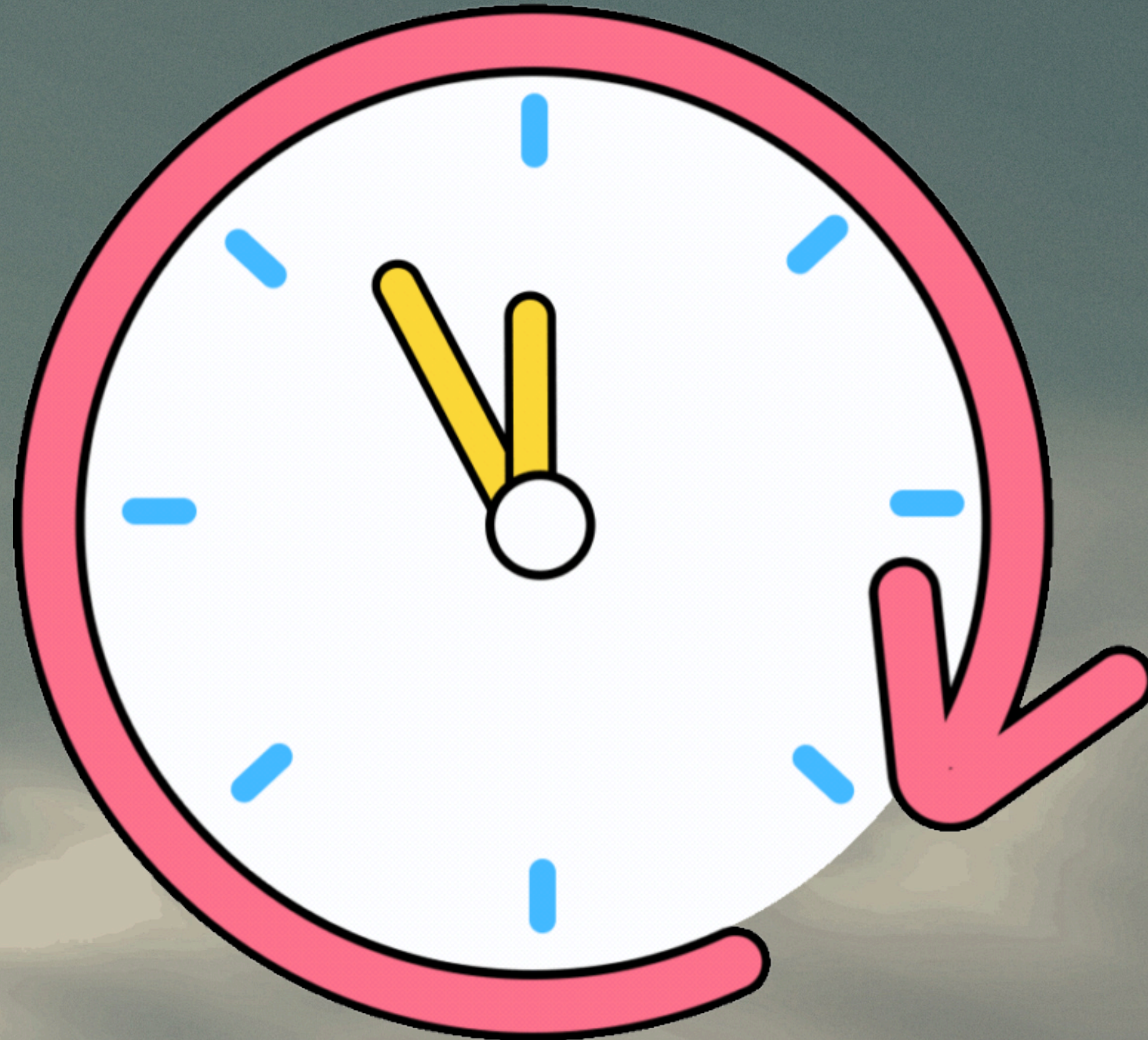
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THANK YOU
AND
QUESTIONS

