PARKS PROJECT PT.2

An Analysis of Park Usage & Users in 4 Boston Parks

RESEARCH DIVISION

City of Boston
Planning Department

PARKS PROJECT PT.2

1. **INTRODUCTION**
2. **CHARACTERIZING PARK USAGE**
   Billings, Christopher, Noyes, Roberts
3. **CHARACTERIZING PARK USERS**
   Billings, Christopher, Noyes, Roberts
4. **CHARACTERIZING PARK CONTEXT**
5. **CONCLUSION**

Introduction

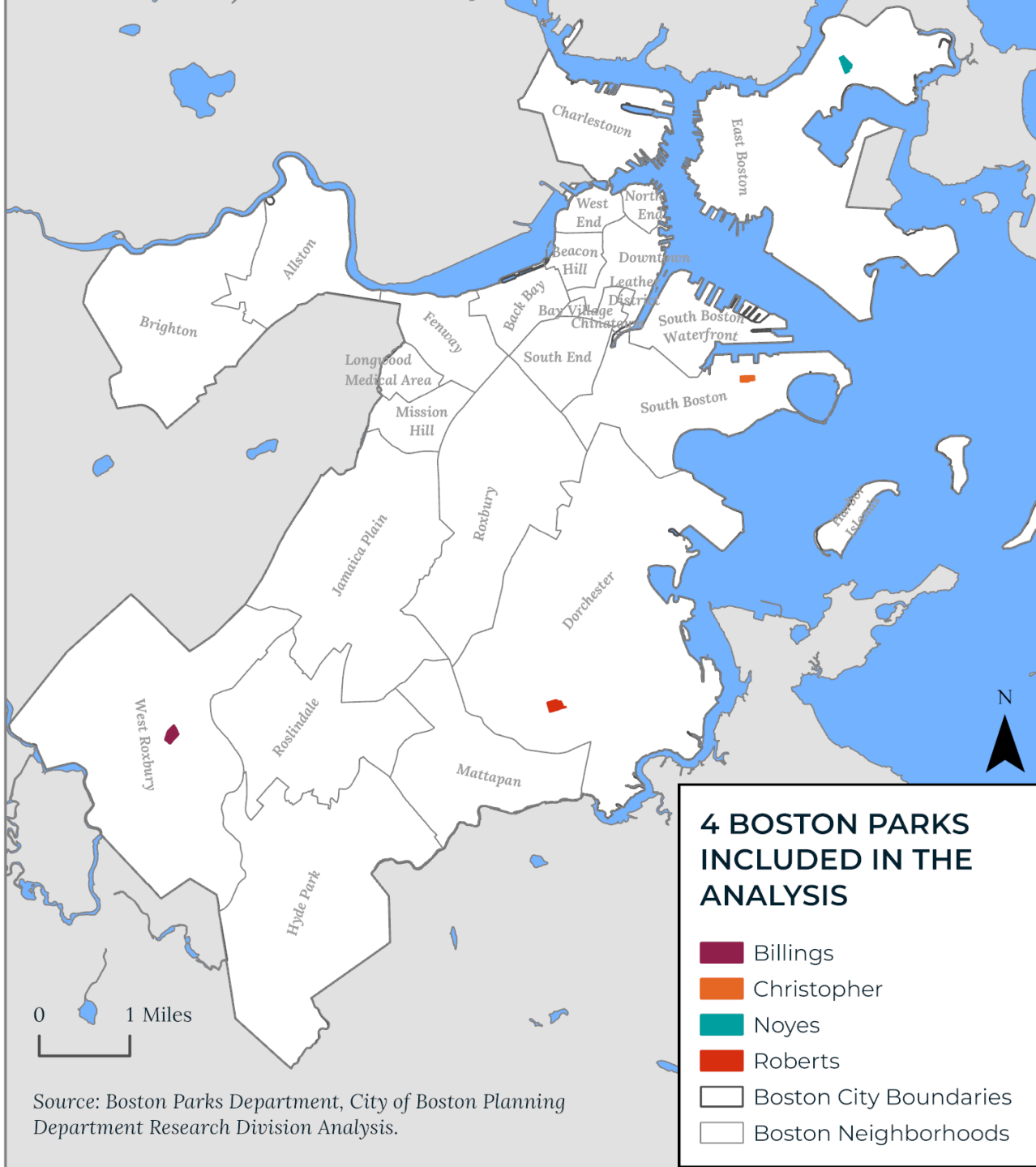
Research Question

How can we characterize park use?

- How many people visit the park?
- How has park use changed over time?
- How do patterns of park use vary between parks?
- Who uses the park?
- What contextual factors might relate to park use?

Research Project Scope

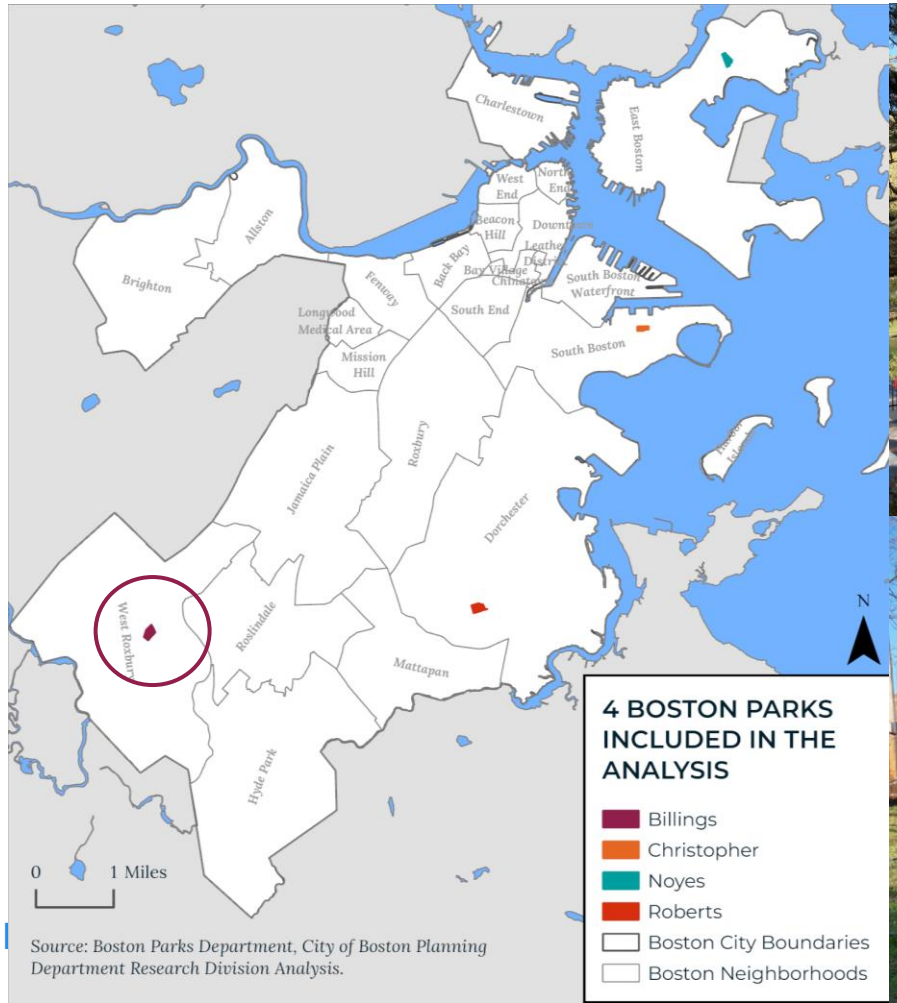
In Billings, Christopher Lee, Noyes, and Roberts parks?



Source: Boston Parks Department, City of Boston Planning Department Research Division Analysis.

Park #1: Billings Field

Where is it?



Characteristics

- Billings is a family friendly neighborhood park located in West Roxbury.
- Billings is a 10.8 acre park with the following assets:
  - Athletic fields,
  - Basketball courts,
  - Playground,
  - Tennis courts,
  - Spray play.

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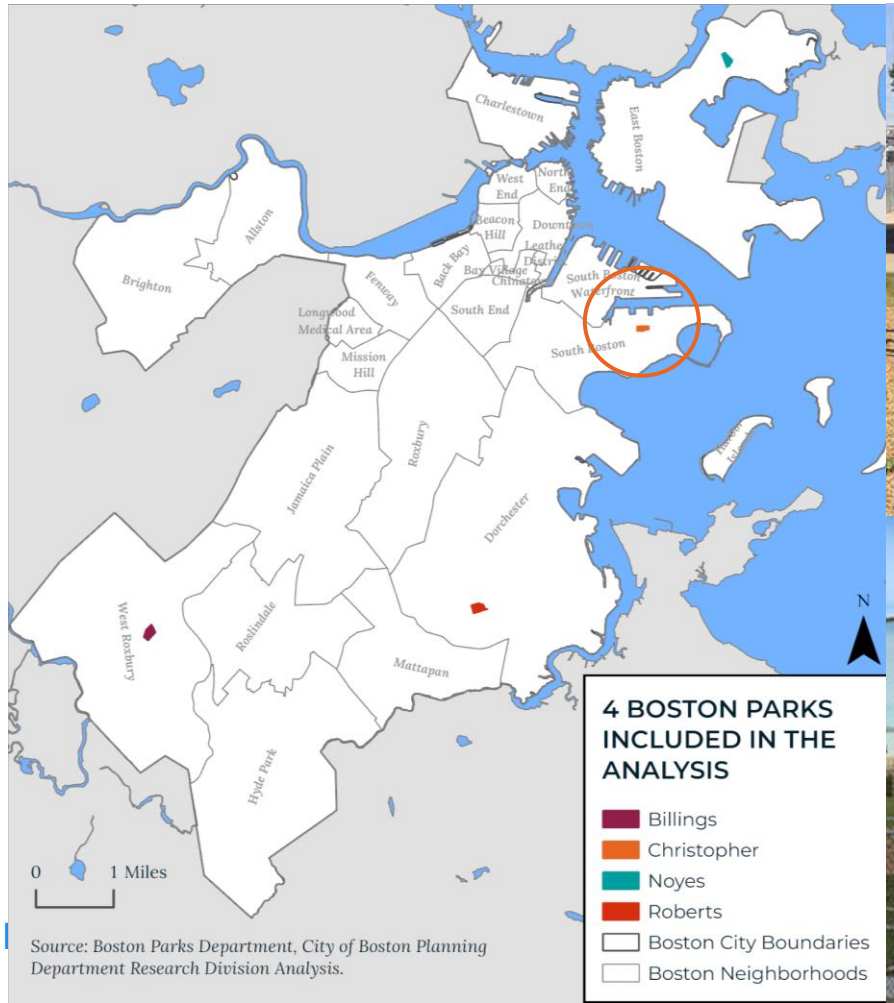
Park #2: Christopher Lee Playground

Where is it?



Characteristics

- Christopher Lee is a pet and family friendly neighborhood park located in South Boston.
- Christopher is a 5.4 acre park with the following assets:
  - Athletic fields,
  - Basketball court,
  - Playground.

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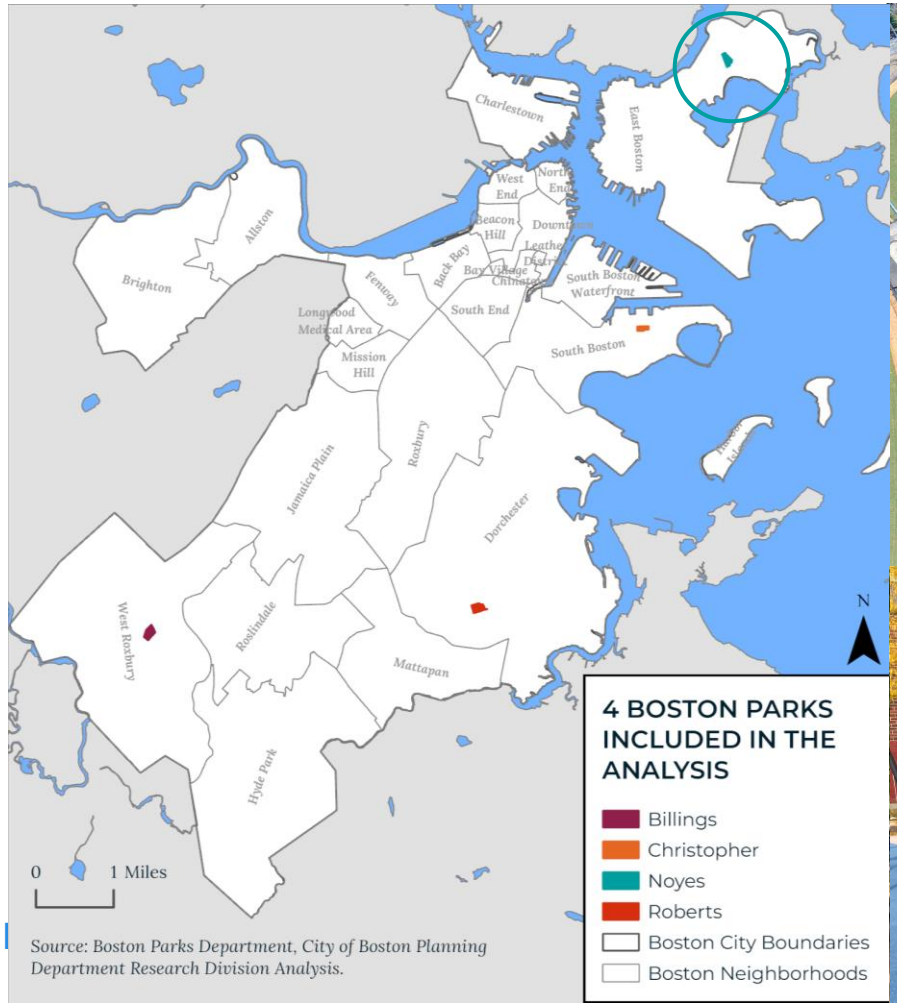
Park #3: Noyes Playground

Where is it?



Characteristics

- Noyes is a family friendly neighborhood park located in East Boston.
- Noyes is a 8.3 acre park with the following assets:
  - Athletic fields,
  - Basketball courts,
  - Playground,
  - Spray play.

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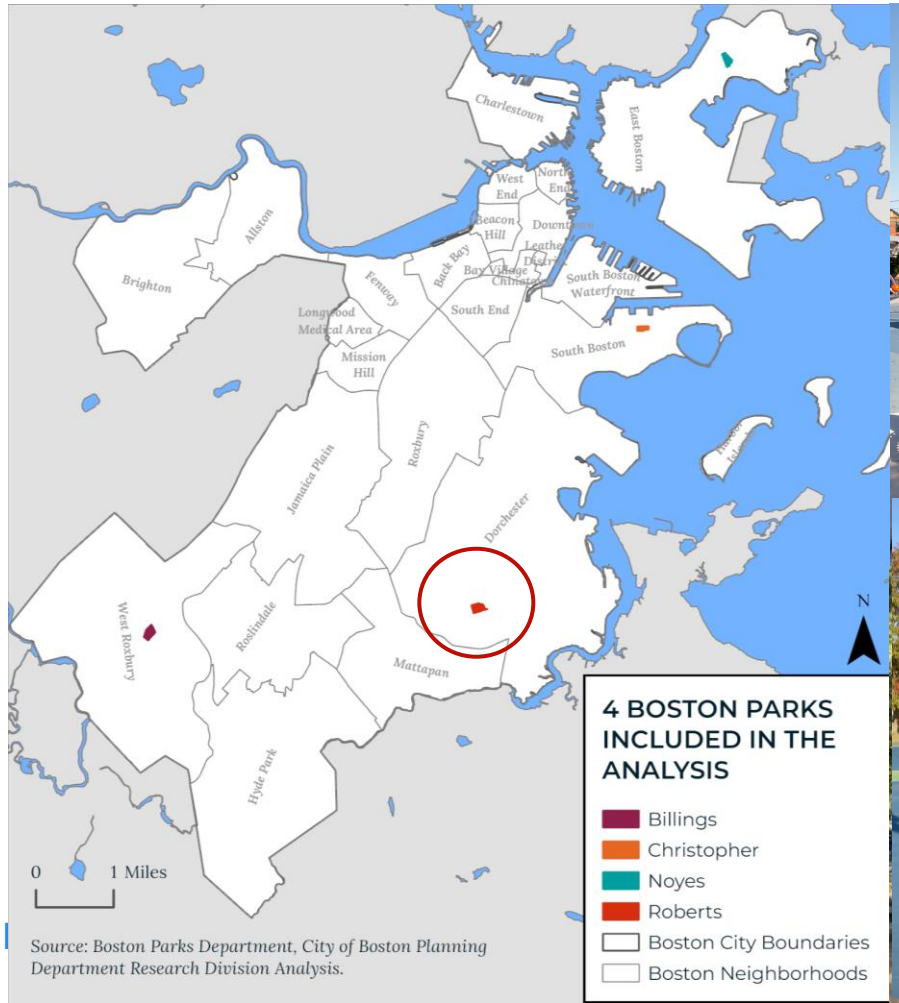
Park #4: Roberts Playground

Where is it?



Characteristics

- Roberts is a family friendly neighborhood park located in Dorchester.
- Roberts is a 10.2 acre park with the following assets:
  - Athletic fields,
  - Basketball courts,
  - Playground,
  - Spray play.

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ABOUT THE DATA

Streetlight

- Used their estimated pedestrian traffic data: modeled data estimate of the average pedestrian traffic in the zone for a typical day/time combination in the time series.
- **Metric: Streetlight Pedestrian Volume**
  - = the number of pedestrian trips that interact with your zone of analysis.
  - Pedestrian trips identified in location data sources (including cellphone mobility data) and differentiated from trips using other modes.
- **Streetlight** calculates the **Pedestrian Volume estimate** by:
  - Computing a population factor for each trip and using these factors to weight the pedestrian trip sample by local population.
  - Using the vehicle penetration rate near the target zone to estimate the pedestrian penetration rate.
  - Reducing the Pedestrian Volume estimate by a constant factor to index more closely to permanent pedestrian counters.
- **Demographics** of park users are ***estimated*** based on their ***inferred*** home block group locations.
  - Based on the census block groups the inferred home locations are in and how many people come from those block groups, an estimation is made of the demographic breakdown of the park users along various demographic axes: race, income, age, etc., using Census data.

U.S. Census Bureau

- Used the U.S. Census Bureau API to access demographic data for the relevant block groups (identified via Streetlight for park users and via BPRD-provided walkshed service area shapefile for walkshed comparison) from the 5-year American Community Survey 2017-2021 to reflect the most recent available year of Streetlight data (2021).

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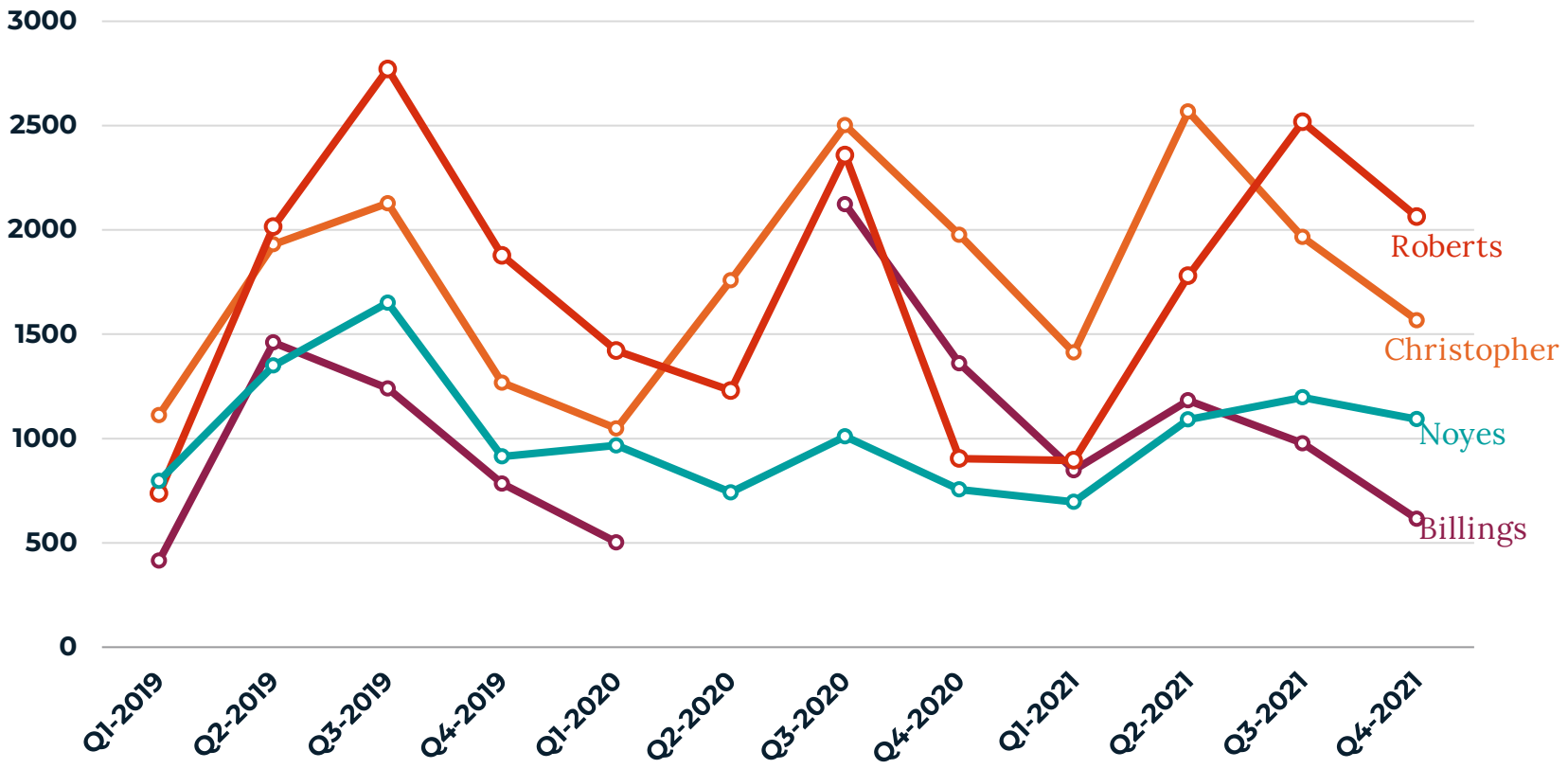
Park Visitorship 2019 -2021 for Roberts, Christopher, Noyes, and Billings Parks

Average Daily Zone Traffic by Year by 3 Mo Increment, 2019 - 2021



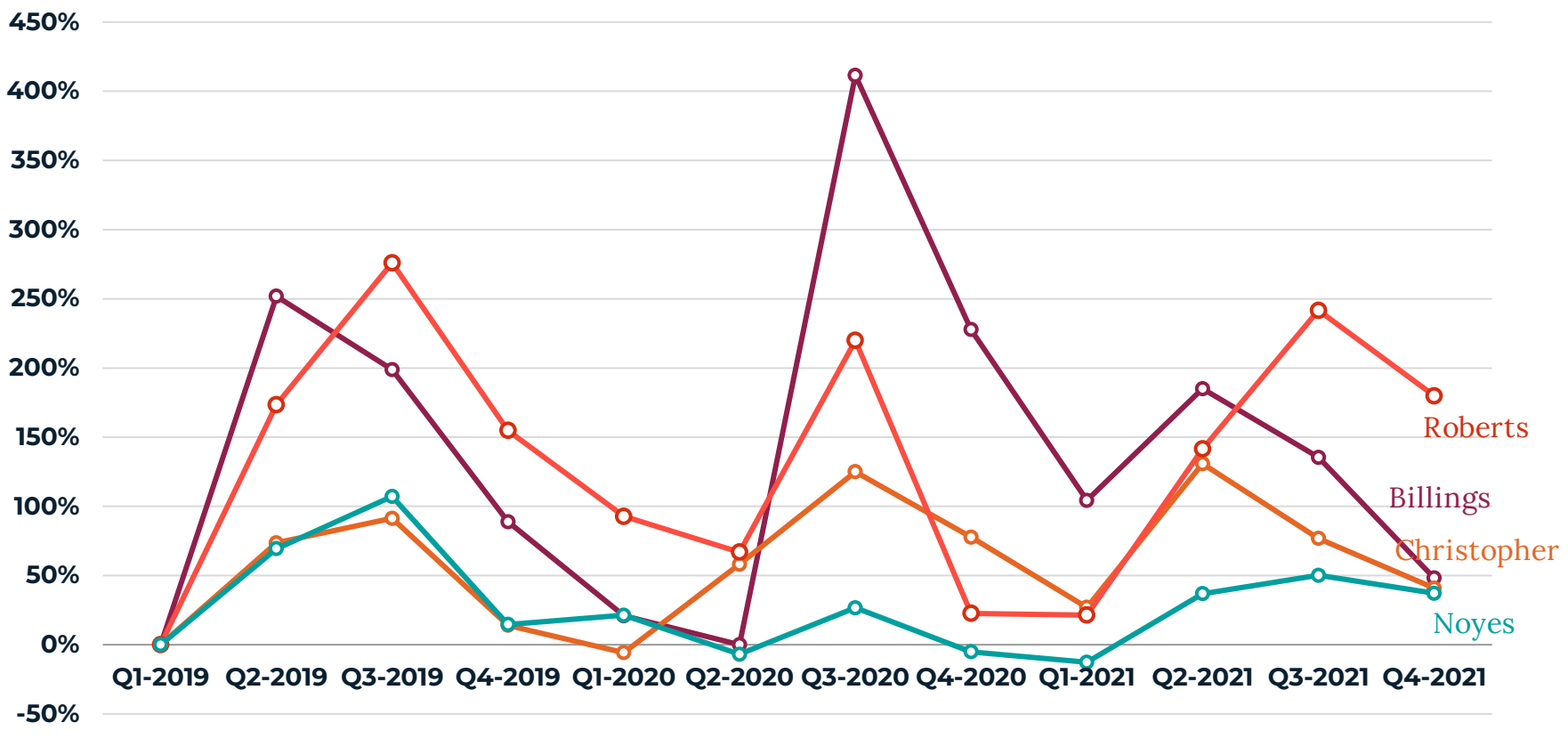
- **Christopher Lee** and **Roberts** parks appear to have the highest average daily pedestrian traffic.
- While all four parks have similar popular (~Q3) and unpopular (~Q1) periods, their usage patterns **differ** over time.

Note: Billings had missing data for Q2 2020

Source: Streetlight Insight. City of Boston Planning Department Research Division Analysis.

Park Visitorship 2019 -2021 for Roberts, Christopher, Noyes, and Billings Parks

Average Daily Zone Traffic by Year by 3 Mo Increment as a Percentage of Q1 2019, 2019 - 2021



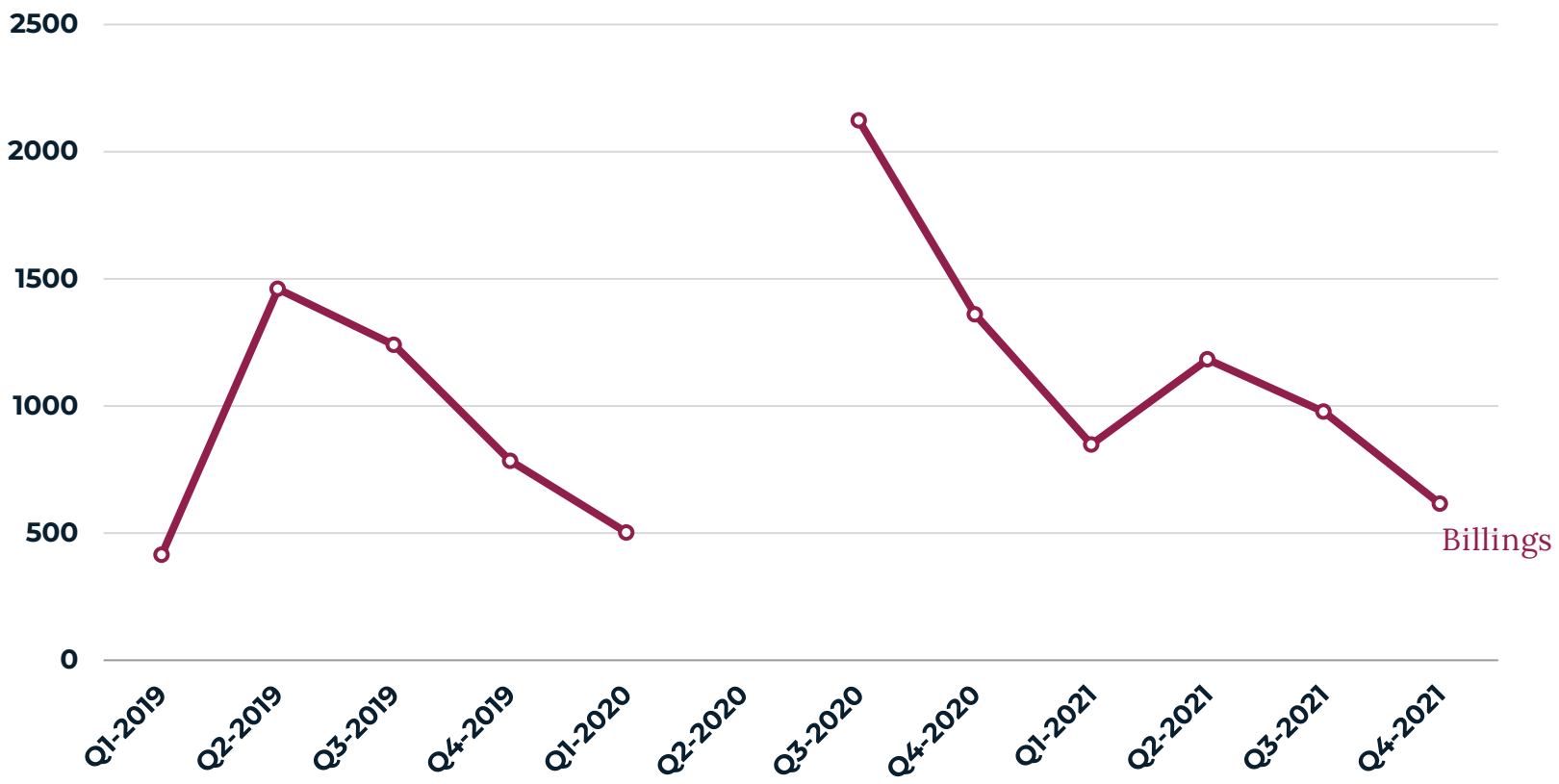
- All 4 parks experienced increases in visitorship relative to 2019 in: Q2-Q3 2019, Q3 2020, Q2 2021.
- For Billings and Roberts, visitorship never fell below Q1 2019 levels.

Note: Billings had missing data for Q2 2020

Source: Streetlight Insight. City of Boston Planning Department Research Division Analysis.

On an average day in 2019 - 2021, Billings saw between ~415-2123 daily visitors

Average Daily Zone Traffic by Year by 3 Mo Increment, 2019 - 2021



- **Billings** saw the highest pedestrian traffic at ~2123 daily park visitors on an average day in July - Sept 2020.
  - The second highest peak was April - June 2019, at ~1460 daily park visitors on an average day.
- The lowest pedestrian traffic was seen in January-March 2019, with an average daily park visitation of ~415.
  - *Park visitation was likely lower in Q2-2020, as the sample size was too small to give a modeled value.*

Source: Streetlight Insight. City of Boston Planning Department Research Division Analysis. Note: *missing data for Q2 2020.*

Park Visitorship 2019 -2021 for Billings

Average Daily Zone Traffic by Year by 3 Mo Increment as a Percentage of Q1 2019, 2019 - 2021

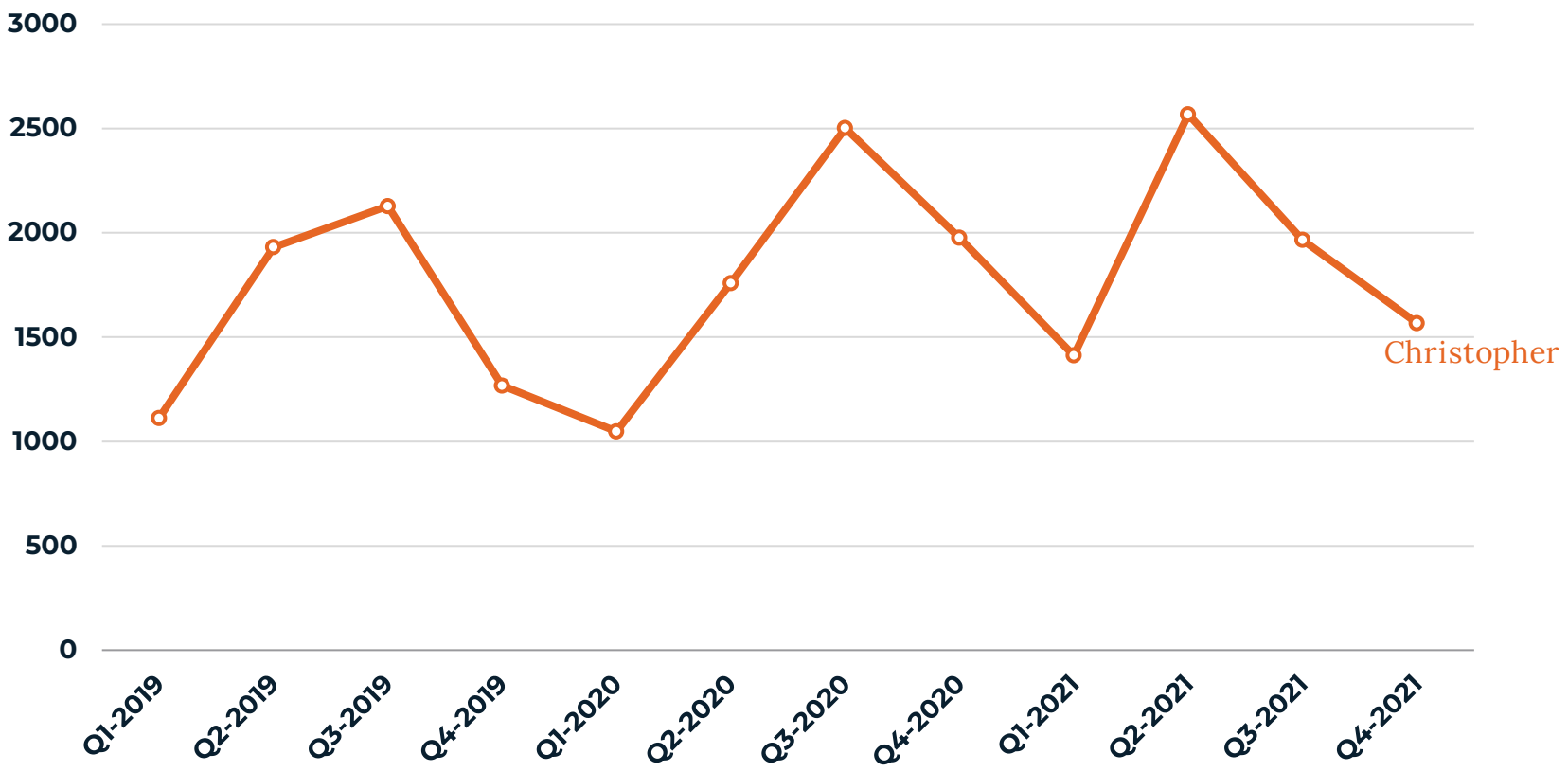
- Billings saw a sharp increase in visitorship relative to Q1 2019 in Q3 2020.
- Visitorship for Billings never dipped below Q1 2019 levels.
- Visitorship remained 20%+ higher than Q1 2019 levels.

Note: missing data for Q2 2020

Source: Streetlight Insight. City of Boston Planning Department Research Division Analysis.

On an average day in 2019 - 2021, Christopher Lee saw between ~1050-2500 daily visitors

Average Daily Zone Traffic by Year by 3 Mo Increment, 2019 - 2021

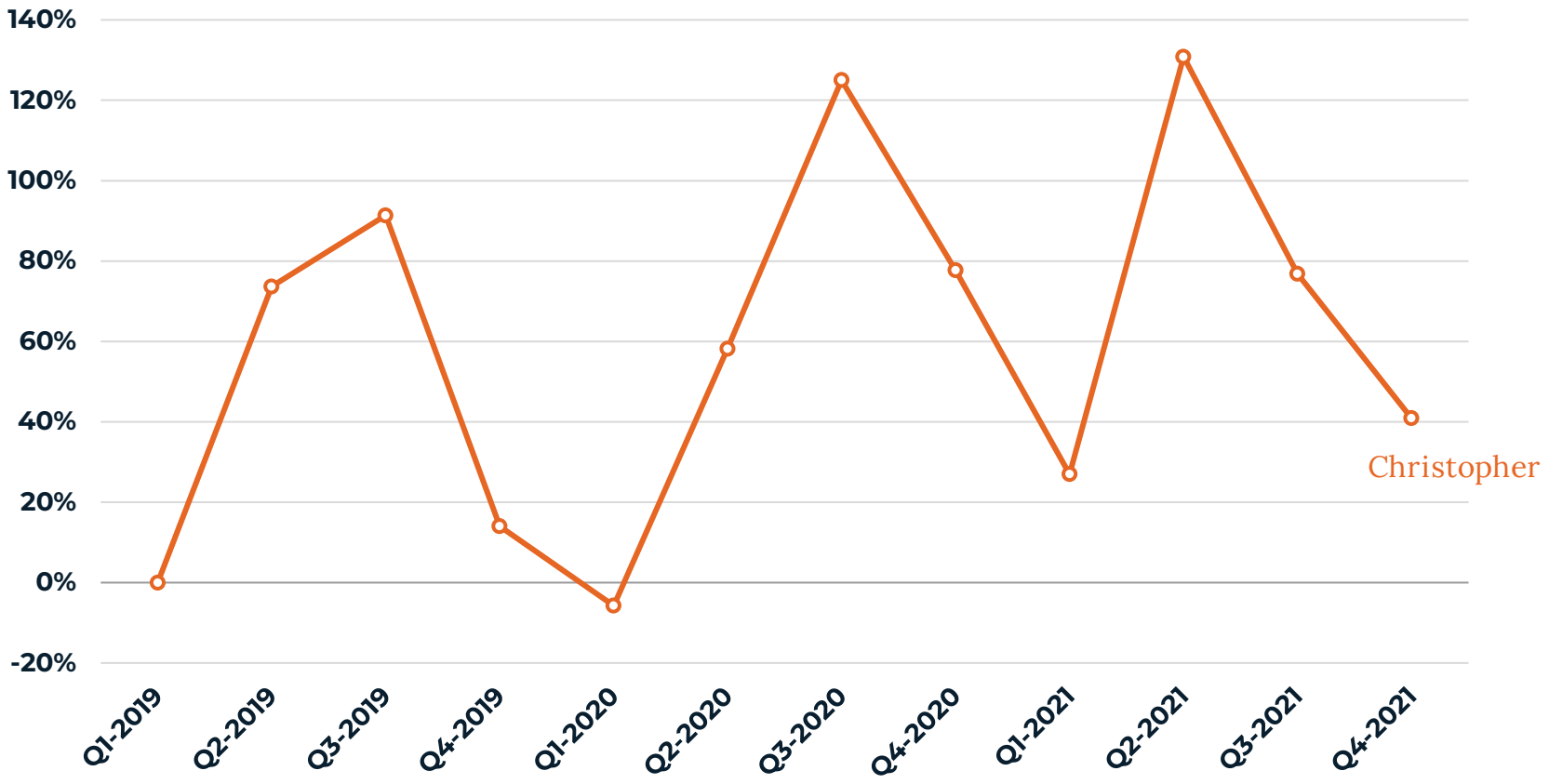


- **Christopher Lee** saw the highest pedestrian traffic at ~2567 daily park visitors on an average day in April-June 2021.
  - The second highest peak was July-September 2020, at ~2502 daily park visitors on an average day.
- The lowest pedestrian traffic was seen in January-March 2020, with an average daily park visitation of ~1048.

Source: Streetlight Insight. City of Boston Planning Department Research Division Analysis.

Park Visitorship 2019 -2021 for Christopher Lee

Average Daily Zone Traffic by Year by 3 Mo Increment as a Percentage of Q1 2019, 2019 - 2021

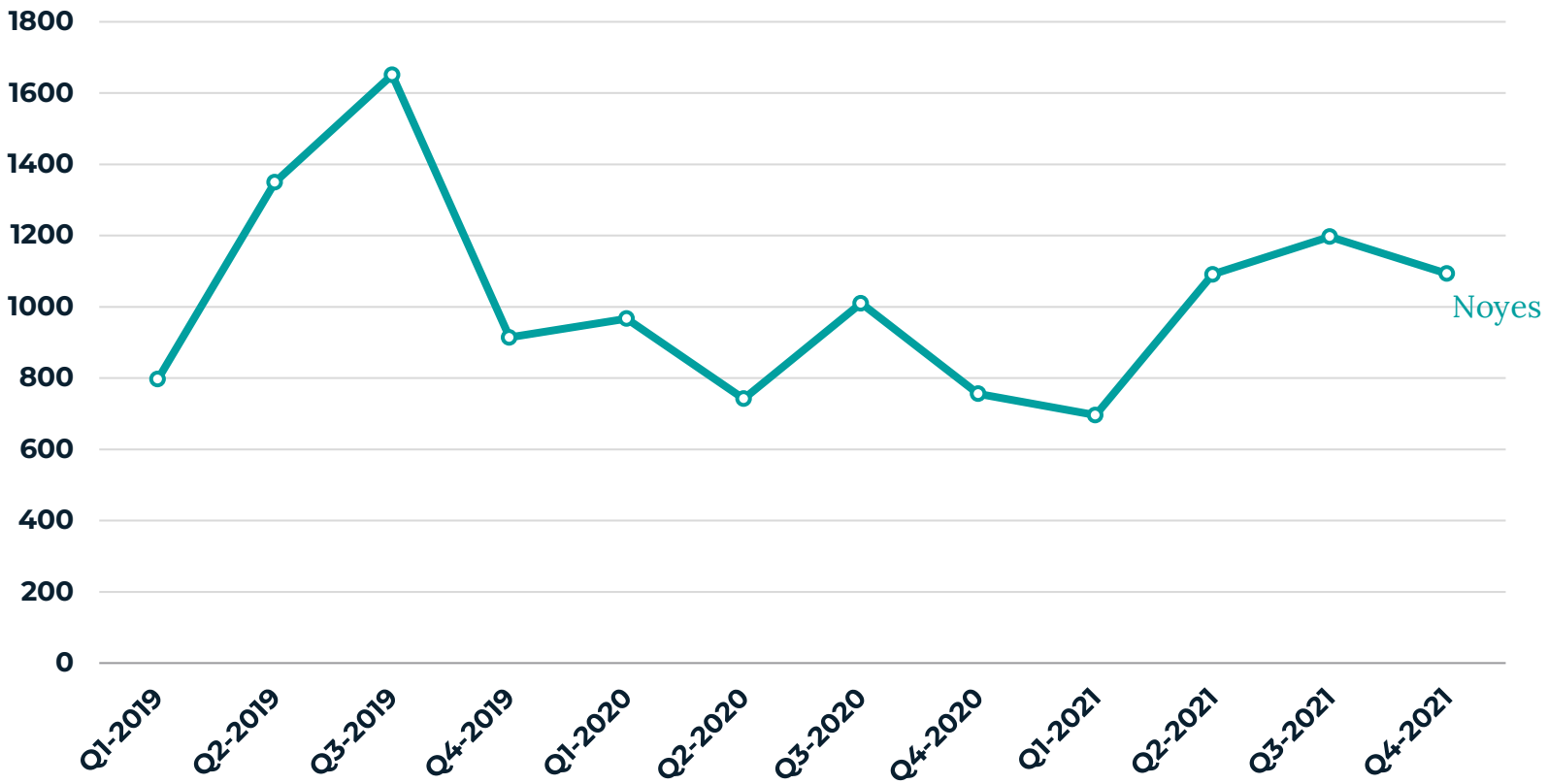


- Christopher Lee park saw the sharpest increases in visitorship relative to Q1 2019 in Q3 2019, Q3 2020, and Q2 2021.
- Visitorship dipped below Q1 2019 levels in Q1 2020, otherwise visitorship remained 14%+ higher than Q1 2019 levels.

Source: Streetlight Insight. City of Boston Planning Department Research Division Analysis.

On an average day in 2019 - 2021, Noyes saw between ~696-1651 daily visitors

Average Daily Zone Traffic by Year by 3 Mo Increment, 2019 - 2021

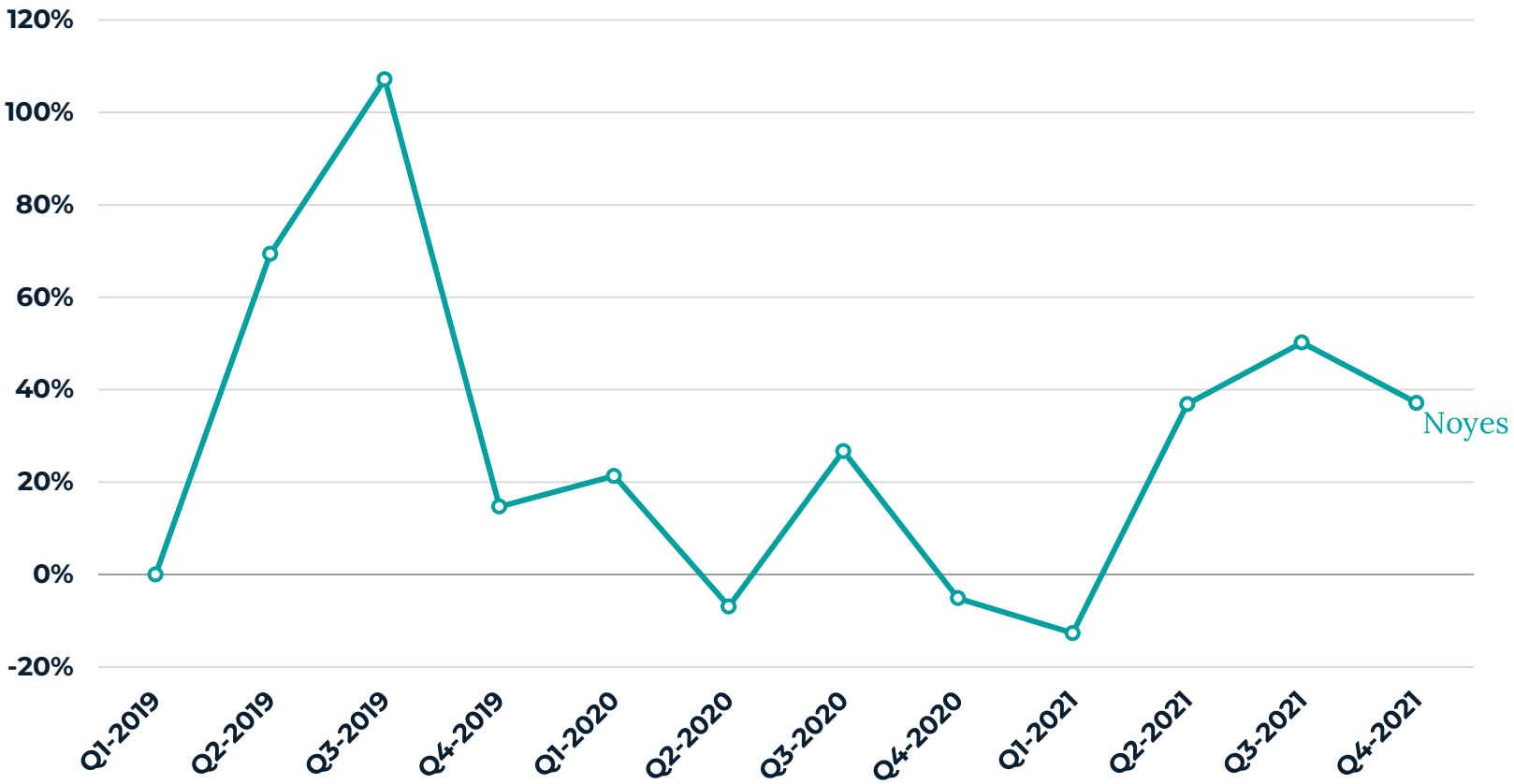


- **Noyes** saw the highest pedestrian traffic at ~1651 daily park visitors on an average day in July - Sept 2019.
  - The second highest peak was July - Sept 2021, at ~1197 daily park visitors on an average day.
- The lowest pedestrian traffic was seen Jan - Mar 2021, with an average daily park visitation of ~696.

Source: Streetlight Insight. City of Boston Planning Department Research Division Analysis.

Park Visitorship 2019 -2021 for Noyes

Average Daily Zone Traffic by Year by 3 Mo Increment as a Percentage of Q1 2019, 2019 - 2021

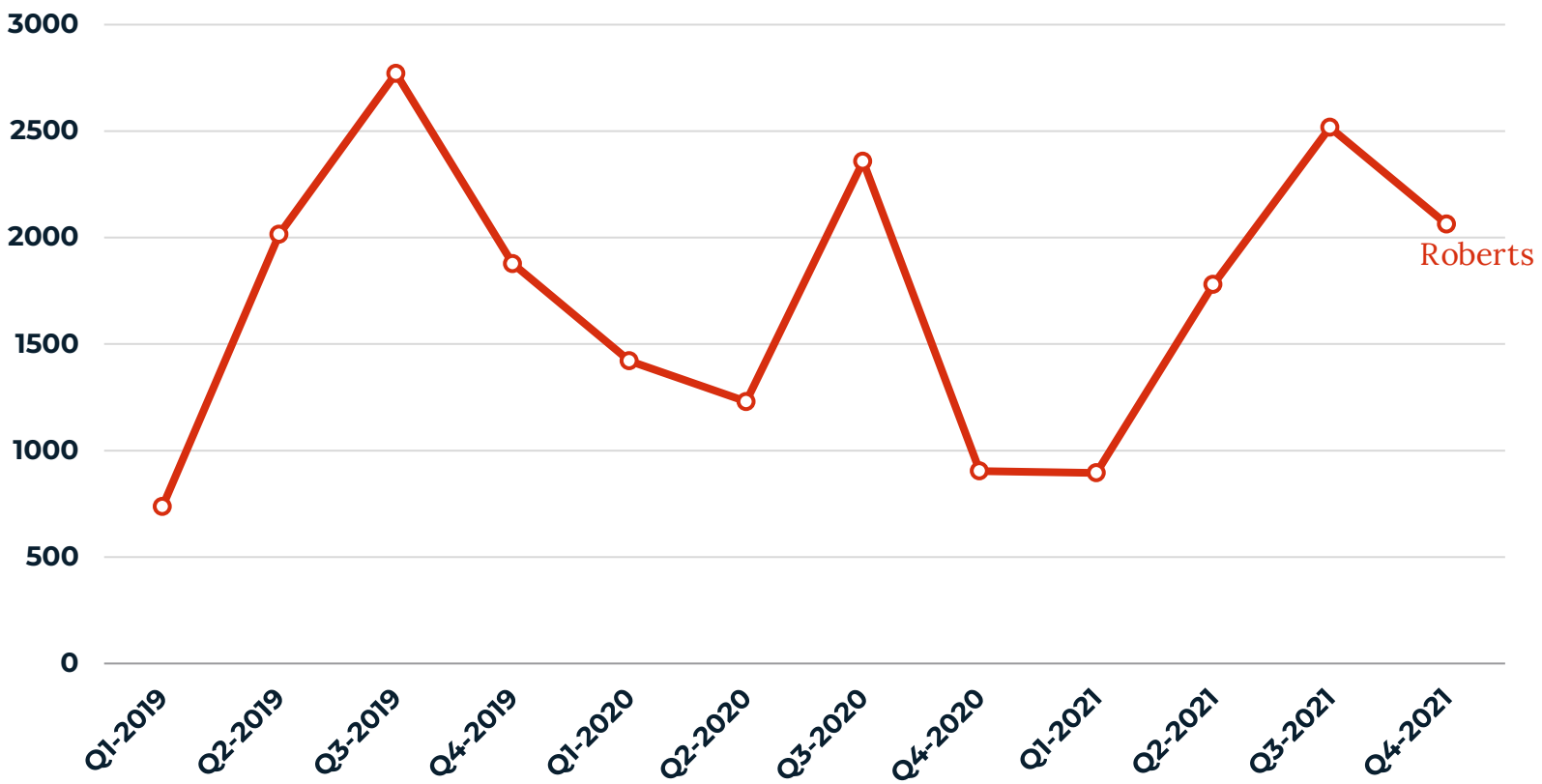


- Noyes park saw the sharpest increases in visitorship relative to Q1 2019 in Q3 2019.
- Visitorship dipped below Q1 2019 levels in Q2 and Q4 2020 and Q1 2021, otherwise visitorship remained 15%+ higher than Q1 2019 levels.

Source: Streetlight Insight. City of Boston Planning Department Research Division Analysis.

On an average day in 2019 - 2021, Roberts saw between ~730-2770 daily visitors

Average Daily Zone Traffic by Year by 3 Mo Increment, 2019 - 2021

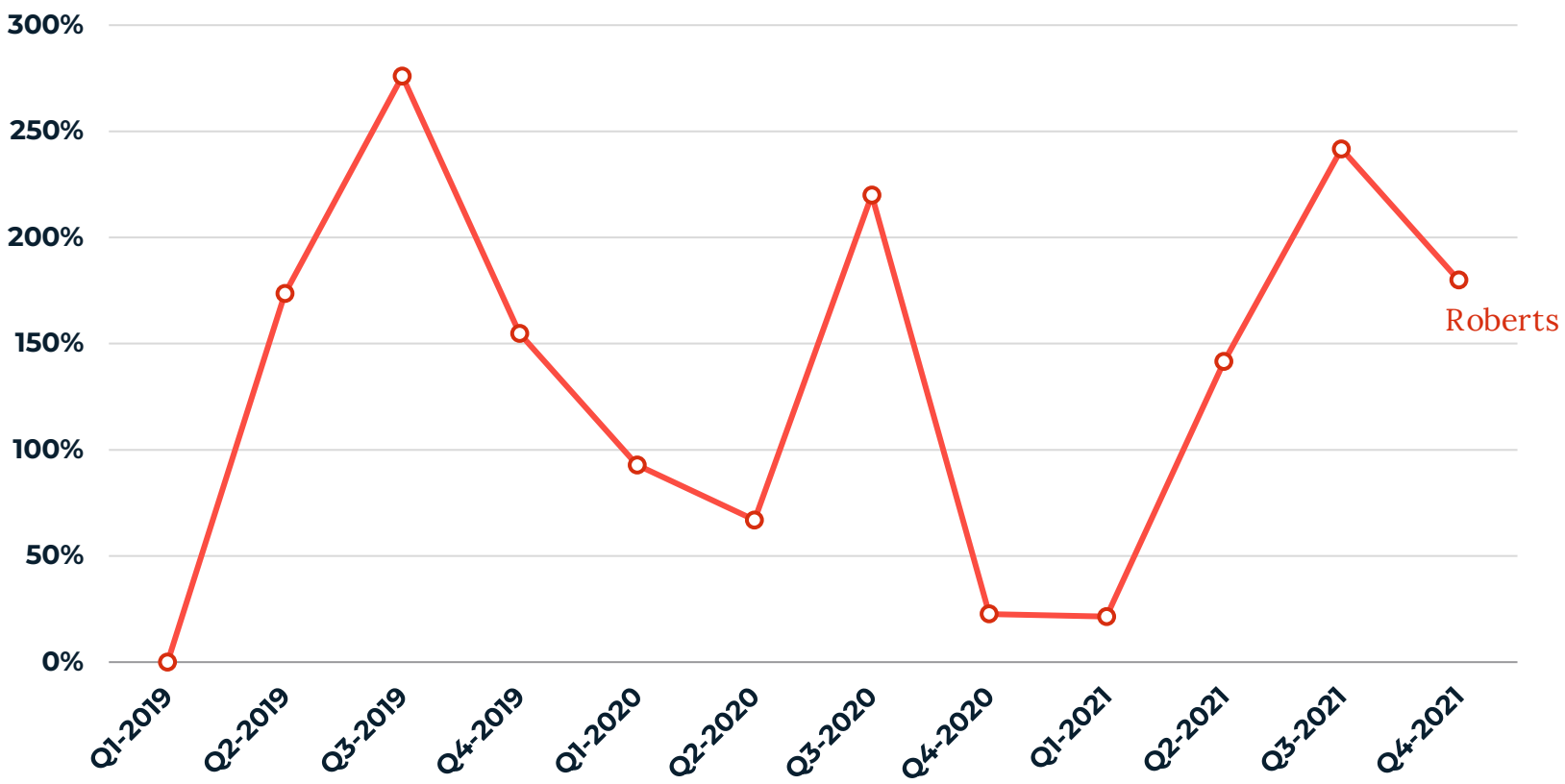


- **Roberts** saw the highest pedestrian traffic at ~2771 daily park visitors on an average day in July - Sept 2019.
  - The second highest peak was July-Sept 2021, at ~2518 daily park visitors on an average day.
- The lowest pedestrian traffic was seen in January-March 2019, with an average daily park visitation of ~737.

Source: Streetlight Insight. City of Boston Planning Department Research Division Analysis.

Park Visitorship 2019 -2021 for Roberts

Average Daily Zone Traffic by Year by 3 Mo Increment as a Percentage of Q1 2019, 2019 - 2021



- Roberts park saw the sharpest increases in visitorship relative to Q1 2019 in Q3 2019, Q3 2020, and Q3 2021.
- Visitorship never dipped below Q1 2019.
- Visitorship remained 21%+ higher than Q1 2019 levels.

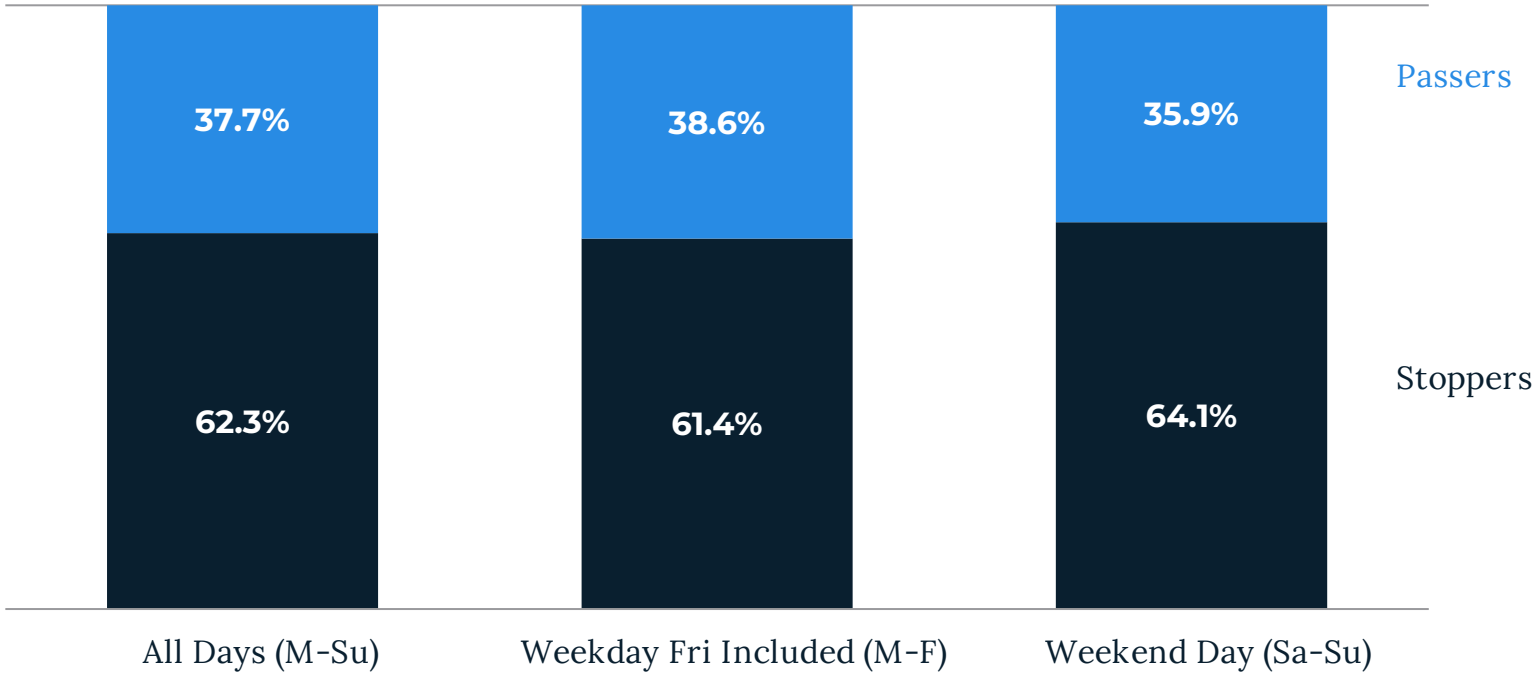
Source: Streetlight Insight. City of Boston Planning Department Research Division Analysis.

Most Billings Field Users are Stoppers

How do people use the park?

PROPORTION OF STOPPERS VS PASSERS

Billings Field, 2021 by Day Type



- Overall, **Billings** is mostly used as a **stopping park**.
- On a typical Mon-Sun day, **1 in 3 park users stop** in Billings park.
- On weekends, the proportion of stoppers is slightly higher than on weekdays.

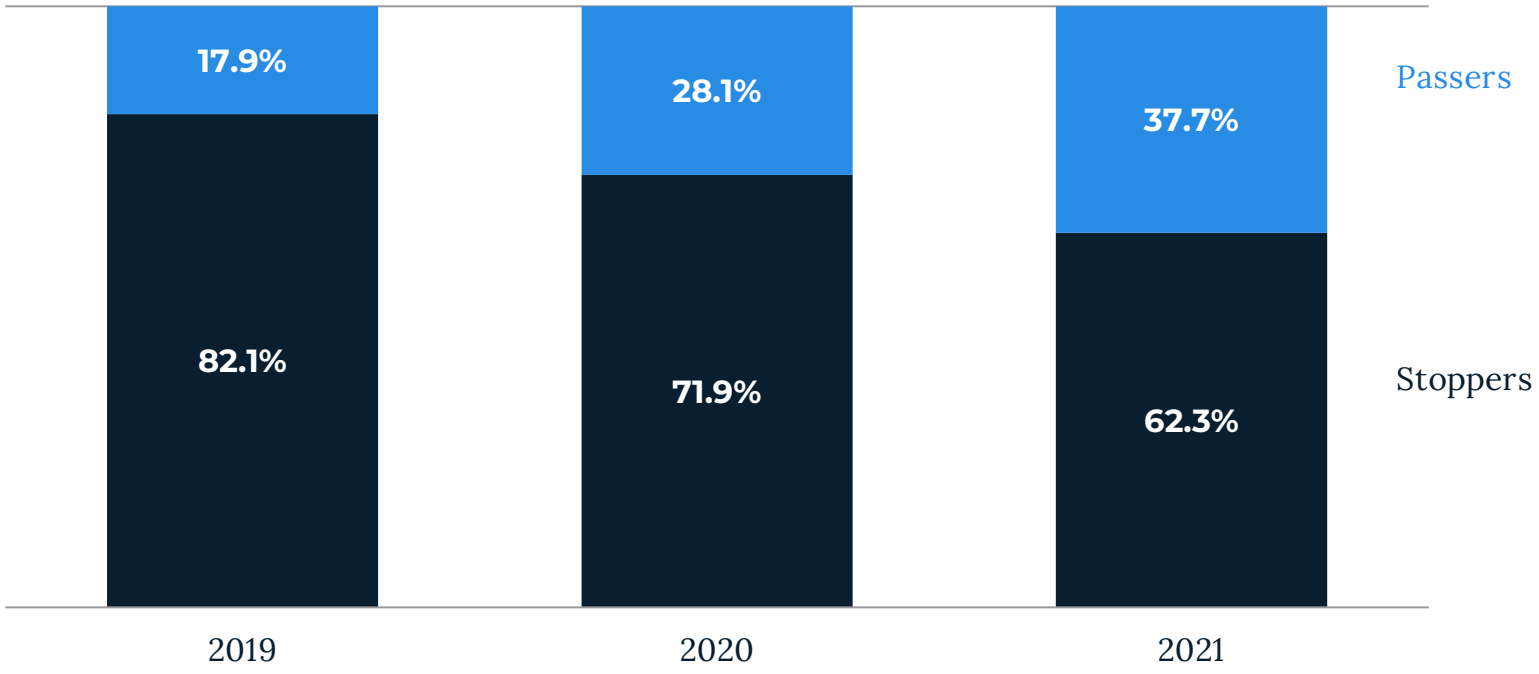
Source: Streetlight Insight, City of Boston Planning Department Research Division Analysis.

Proportion of stoppers decreased over time

How do people use the park?

PROPORTION OF STOPPERS VS PASSERS ON MON-SUN DAY

Billings Field, 2019 - 2021



- For all 3 years, the proportion of stoppers is larger than proportion of passers.
- 2021 saw the lowest proportion of stoppers.
- 2019 saw the highest proportion of stoppers.

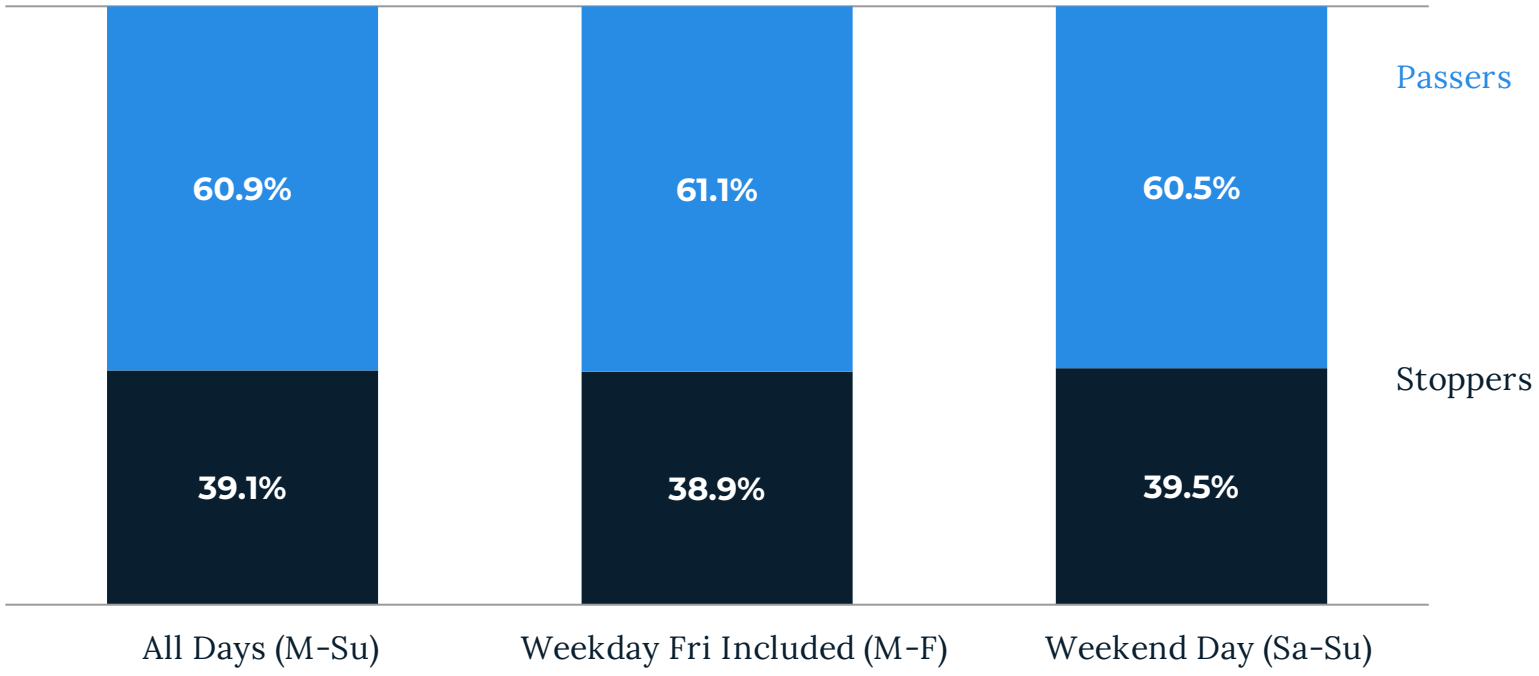
Source: Streetlight Insight, City of Boston Planning Department Research Division Analysis.

Most Christopher Lee Park Users are Passers

How do people use the park?

PROPORTION OF STOPPERS VS PASSERS

Christopher Lee Park 2021 by Day Type



- Overall, Christopher Lee is mostly used as a pass-through park.
- On a typical Mon-Sun day, 6 in 10 park users pass through Christopher Lee park.
- On weekends, the proportion of stoppers is slightly higher than on weekdays.

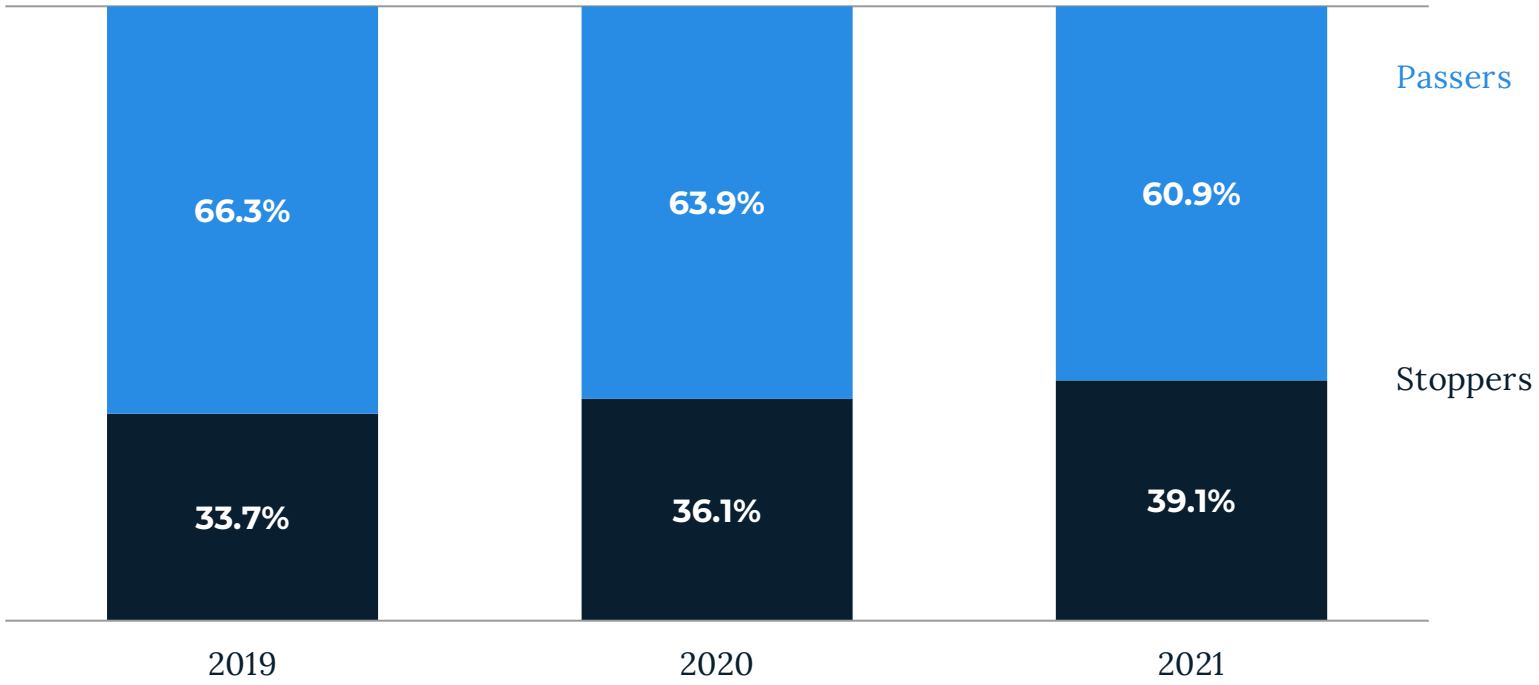
Source: Streetlight Insight, City of Boston Planning Department Research Division Analysis.

Proportion of stoppers increased 2019-21

How do people use the park?

PROPORTION OF STOPPERS VS PASSERS ON MON-SUN DAY

Christopher Lee Park, 2019 - 2021



- For all 3 years, the proportion of passers is larger than the proportion of stoppers.
- 2021 saw the highest proportion of stoppers.
- 2019 saw the lowest proportion of stoppers.

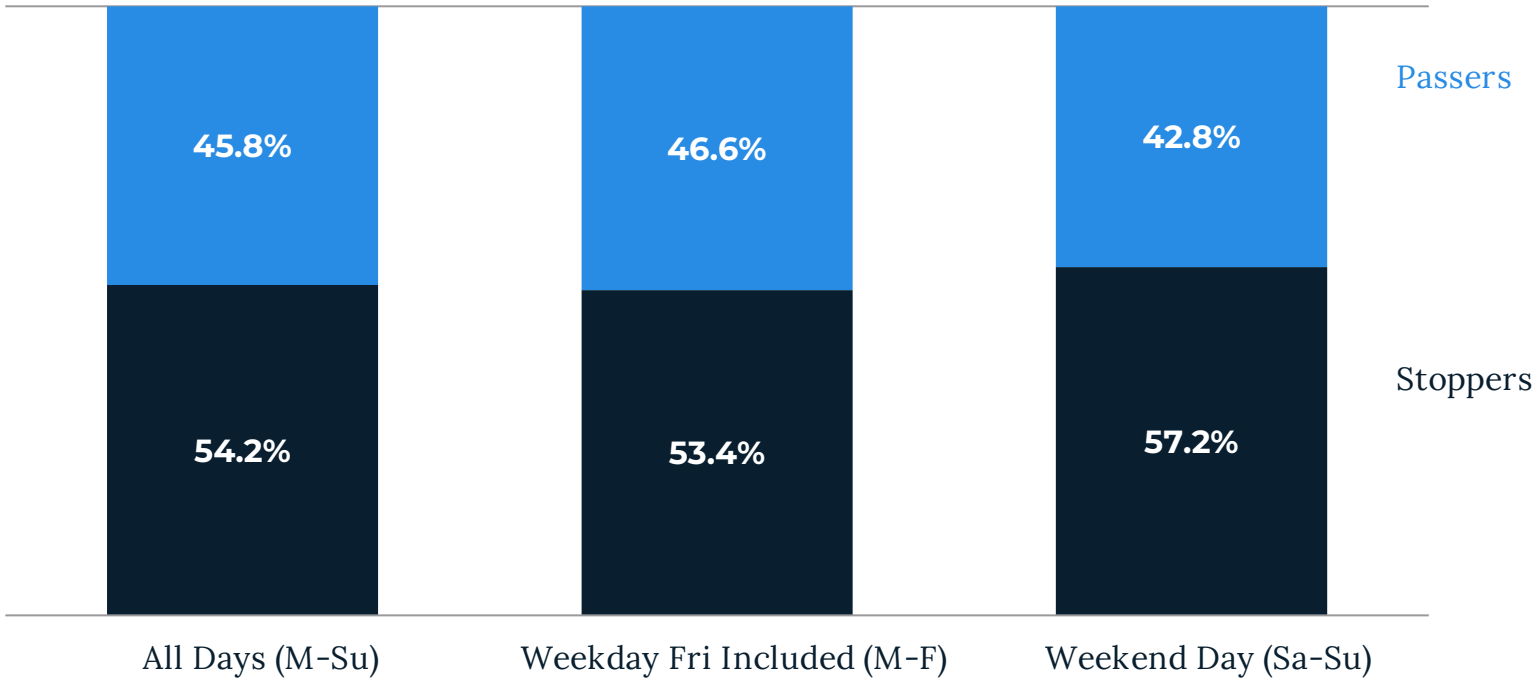
Source: Streetlight Insight, City of Boston Planning Department Research Division Analysis.

Noyes Playground Users are Slightly More Likely to be Stoppers

How do people use the park?

PROPORTION OF STOPPERS VS PASSERS

Noyes Park 2021 by Day Type



- Overall, Noyes is used as a stopping park.
- On a typical Mon-Sun day, about half of park users stop in Noyes park.
- On weekends, the proportion of stoppers is slightly higher than on weekdays.

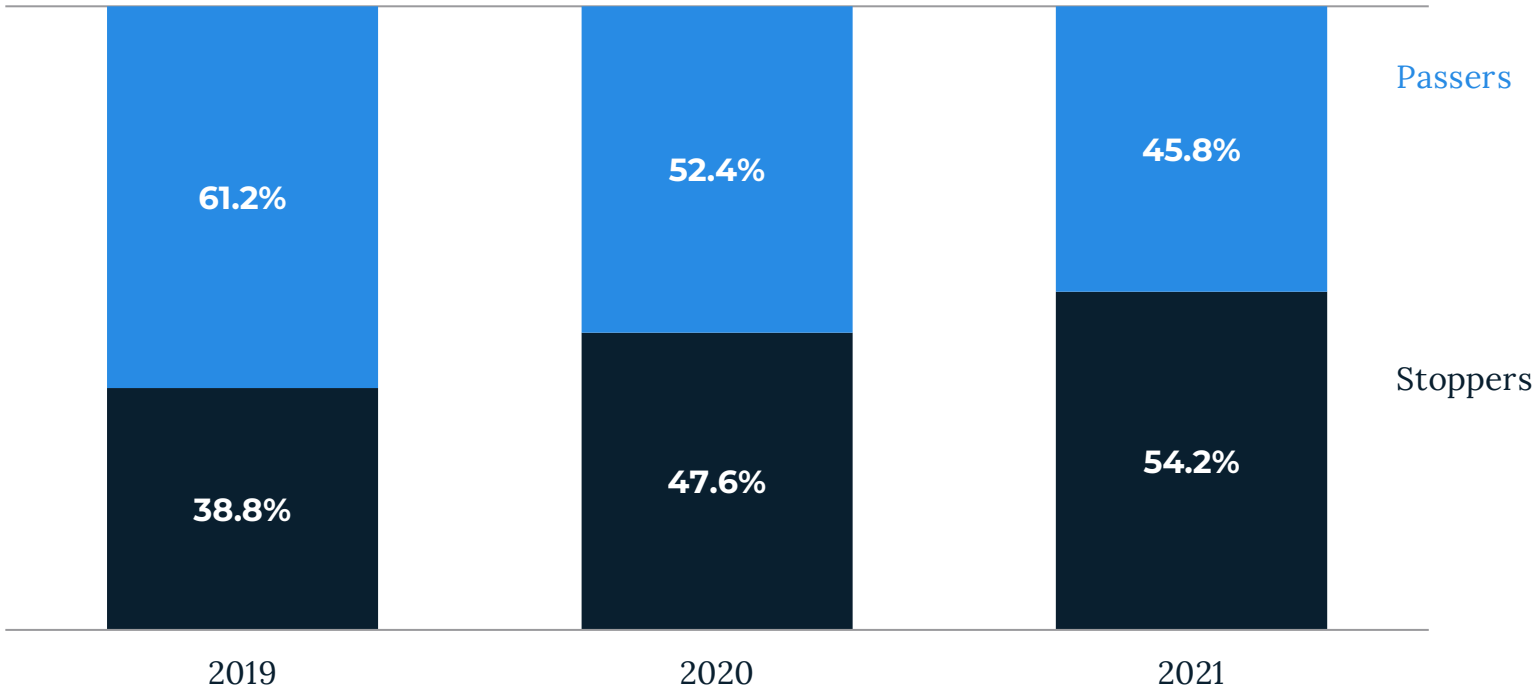
Source: Streetlight Insight, City of Boston Planning Department Research Division Analysis.

Proportion of stoppers increased 2019-21

How do people use the park?

PROPORTION OF STOPPERS VS PASSERS ON MON-SUN DAY

Noyes Park, 2019 - 2021



Source: Streetlight Insight, City of Boston Planning Department Research Division Analysis.

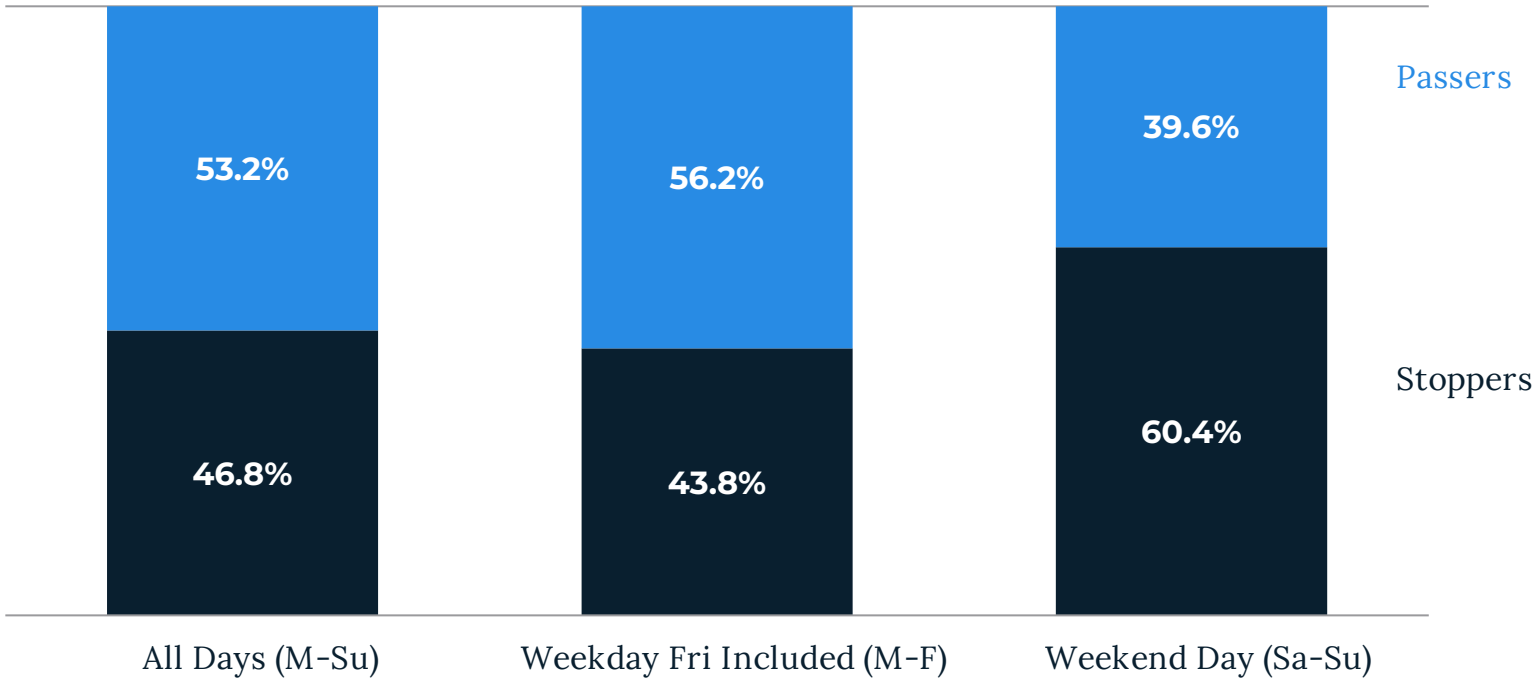
- While in 2019 and 2020 more Noyes park users passed through than stopped, in 2021 more stopped.
- 2021 saw the largest proportion of stoppers.
- 2019 saw the largest proportion of passers.

Roberts park users use the park differently depending on the day type

How do people use the park?

PROPORTION OF STOPPERS VS PASSERS

Roberts Park 2021 by Day Type



- On a typical Mon-Sun day, about half of park users stop in Noyes park.
- On weekends, the proportion of stoppers is significantly higher than on weekdays.

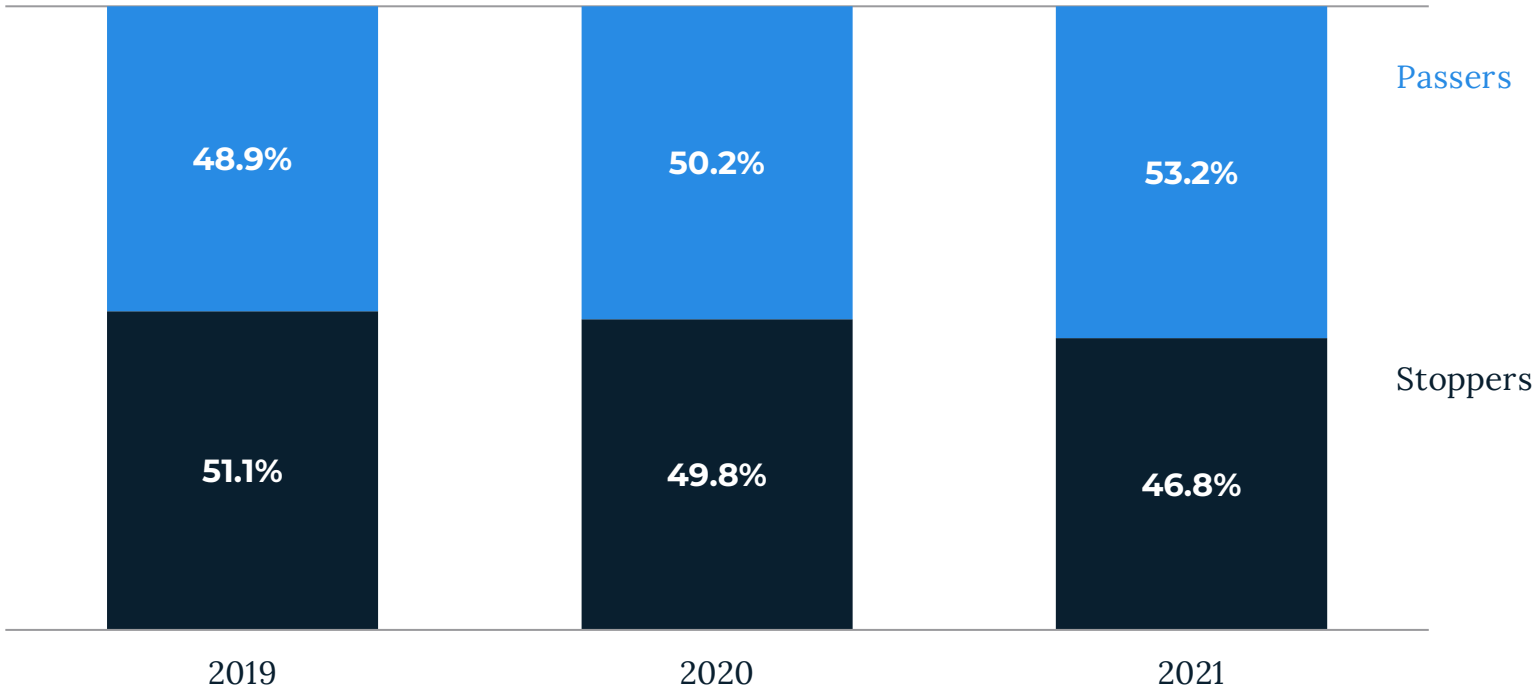
Source: Streetlight Insight, City of Boston Planning Department Research Division Analysis.

Proportion of passers increased 2019-21

How do people use the park?

PROPORTION OF STOPPERS VS PASSERS ON MON-SUN DAY

Roberts Park, 2019 - 2021



- While in 2019 more Roberts park users stopped in the park, in 2020 and 2021 more passed-through.
- 2021 saw the largest proportion of passers.
- 2019 saw the largest proportion of stoppers.

Source: Streetlight Insight, City of Boston Planning Department Research Division Analysis.

Park usage patterns of passers vs stoppers differ between the 4 parks

Summarizing Patterns in Park Use, 2019 - 2021

	BILLINGS West Roxbury	CHRISTOPHER South Boston	NOYES East Boston	ROBERTS Dorchester
% Passers 2021	37.7%	60.9%	45.8%	53.2%
% Passers 2019-21	increased	decreased	decreased	increased
Avg Traffic 2019-21	decreased	increased	decreased	decreased
Most Popular	July - Sept	July - Sept	July - Sept	July - Sept
Least Popular	Jan - Mar	Jan - Mar	Jan - Mar	Jan - Mar

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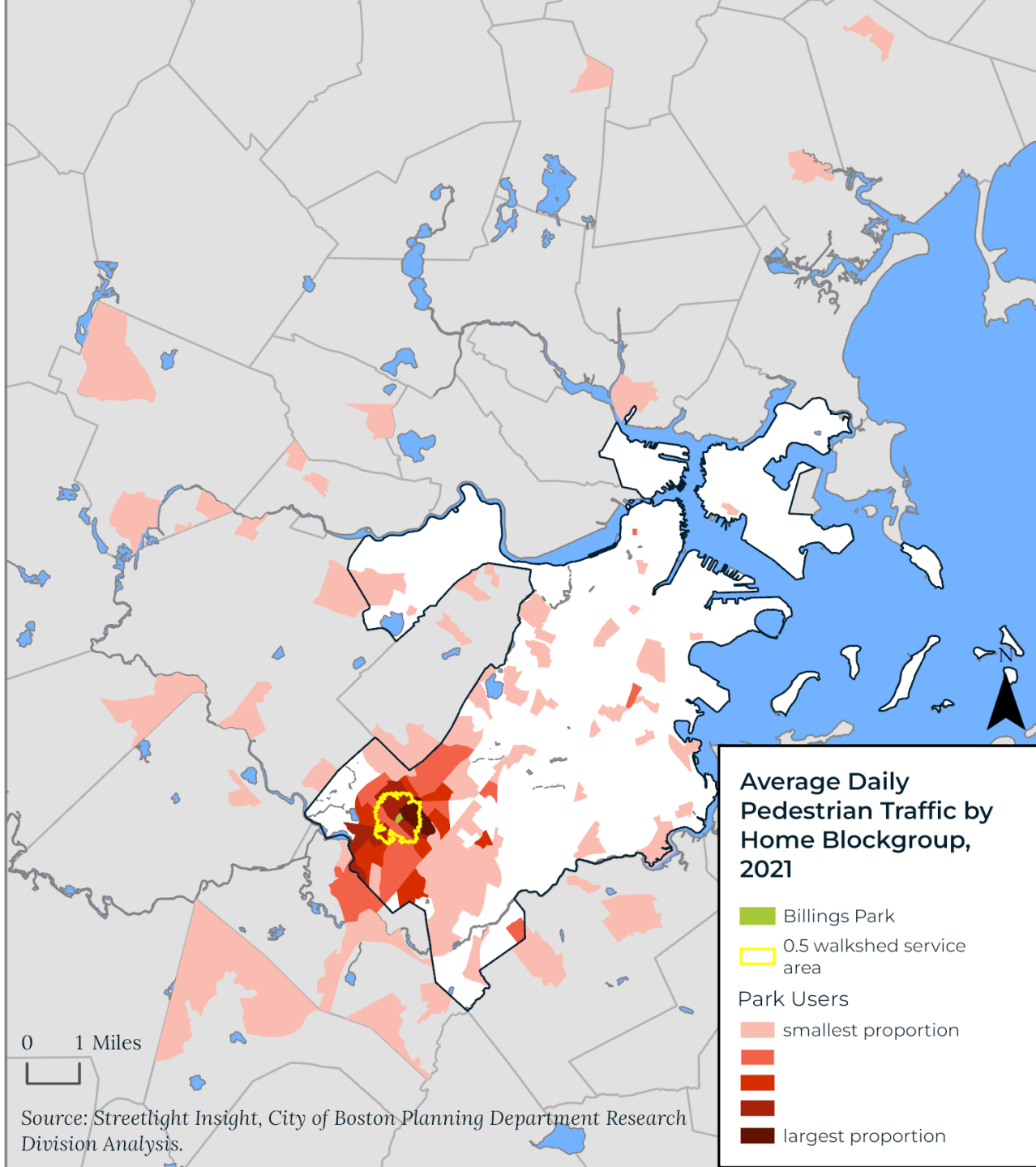
Where do Billings Field users live?

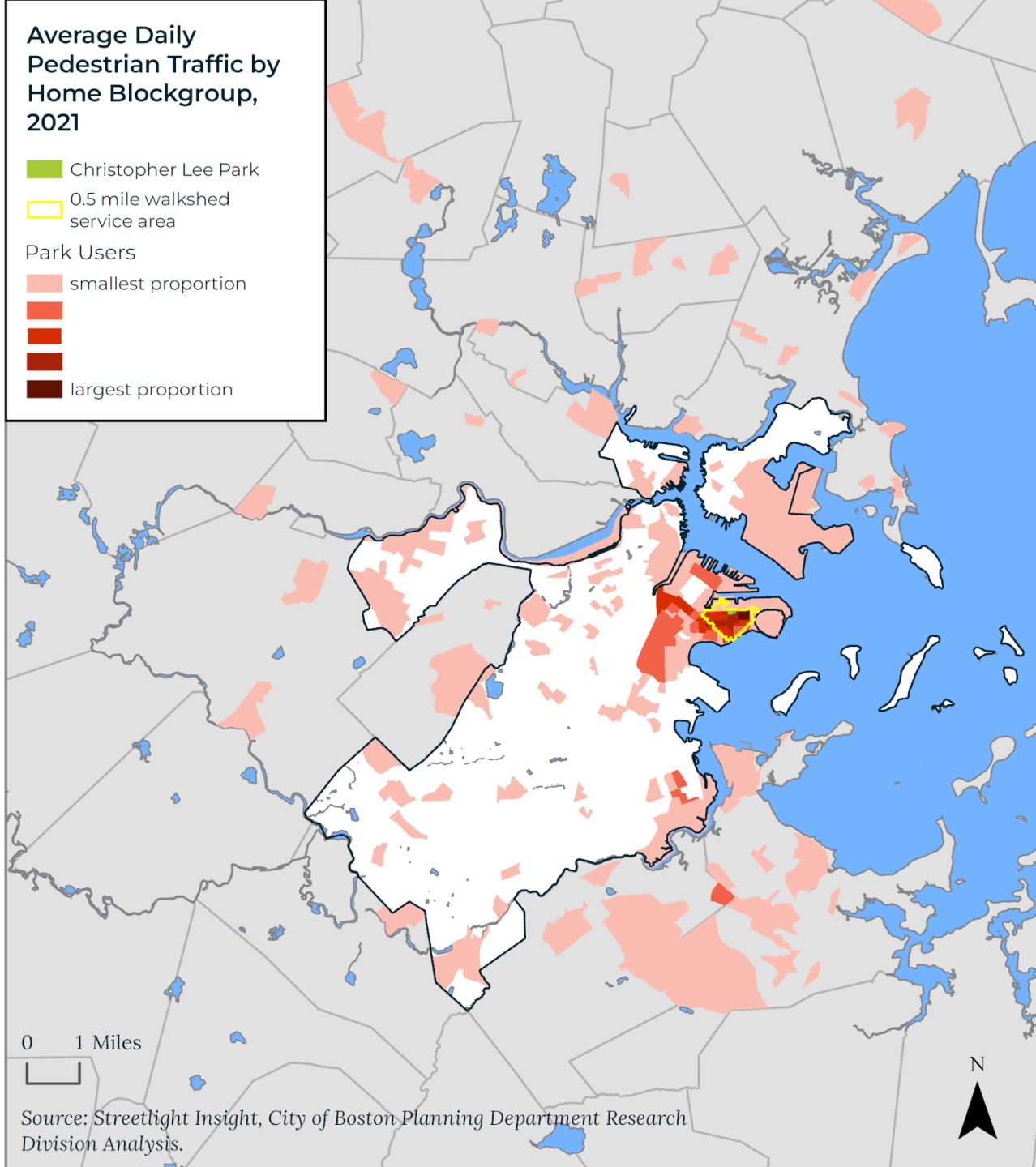
57% of Billings Field users* live within the 0.5 mile walkshed service area

*total restricted to the greater Boston area bounded by I-95



Where do Christopher Park users live?

60% of Christopher Lee Park users* live within the 0.5 mile walkshed service area

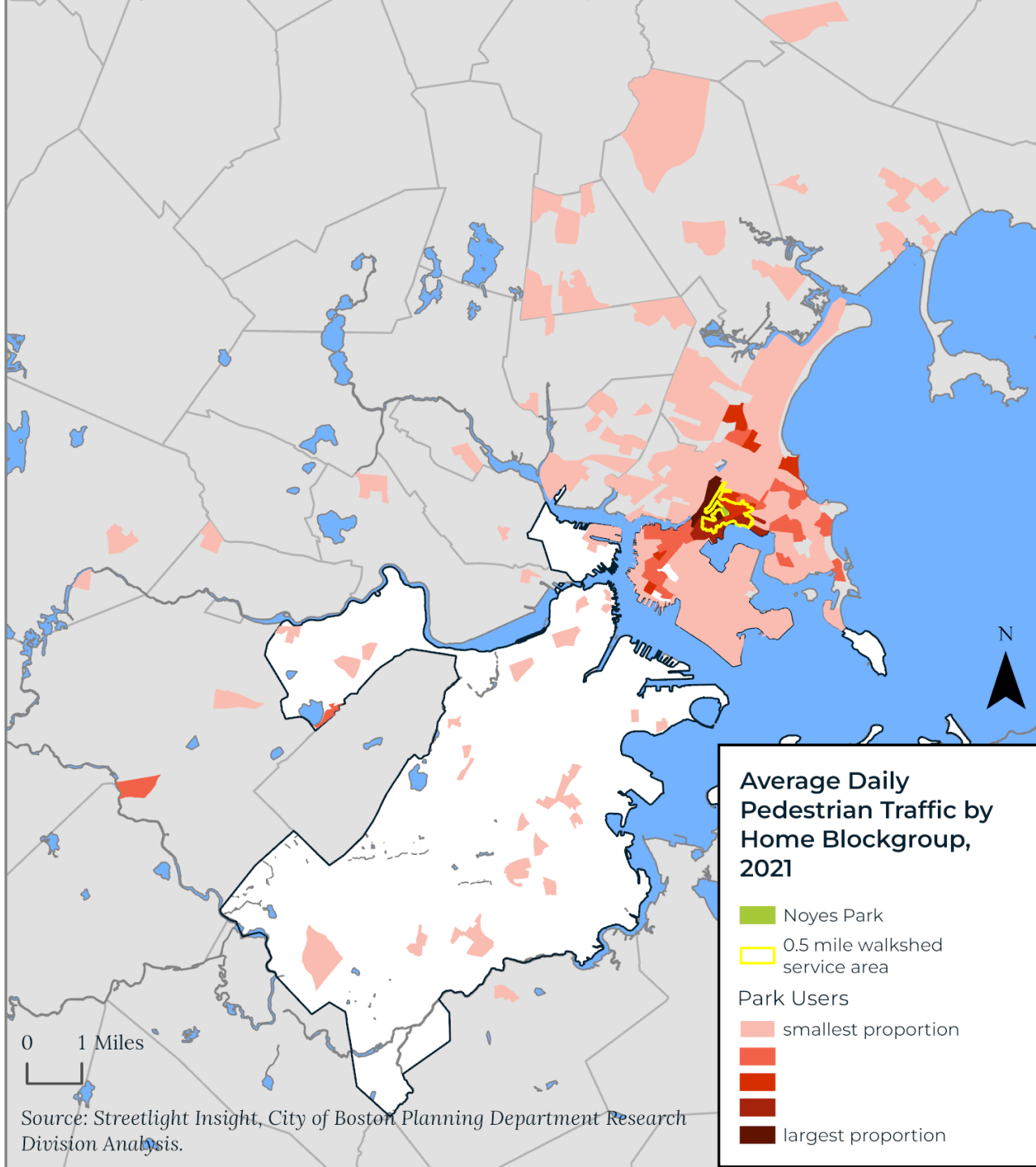


*total restricted to the greater Boston area bounded by I-95

Where do Noyes Park users live?

34% of Noyes Park users* live within the 0.5 mile walkshed service area

*total restricted to the greater Boston area bounded by I-95

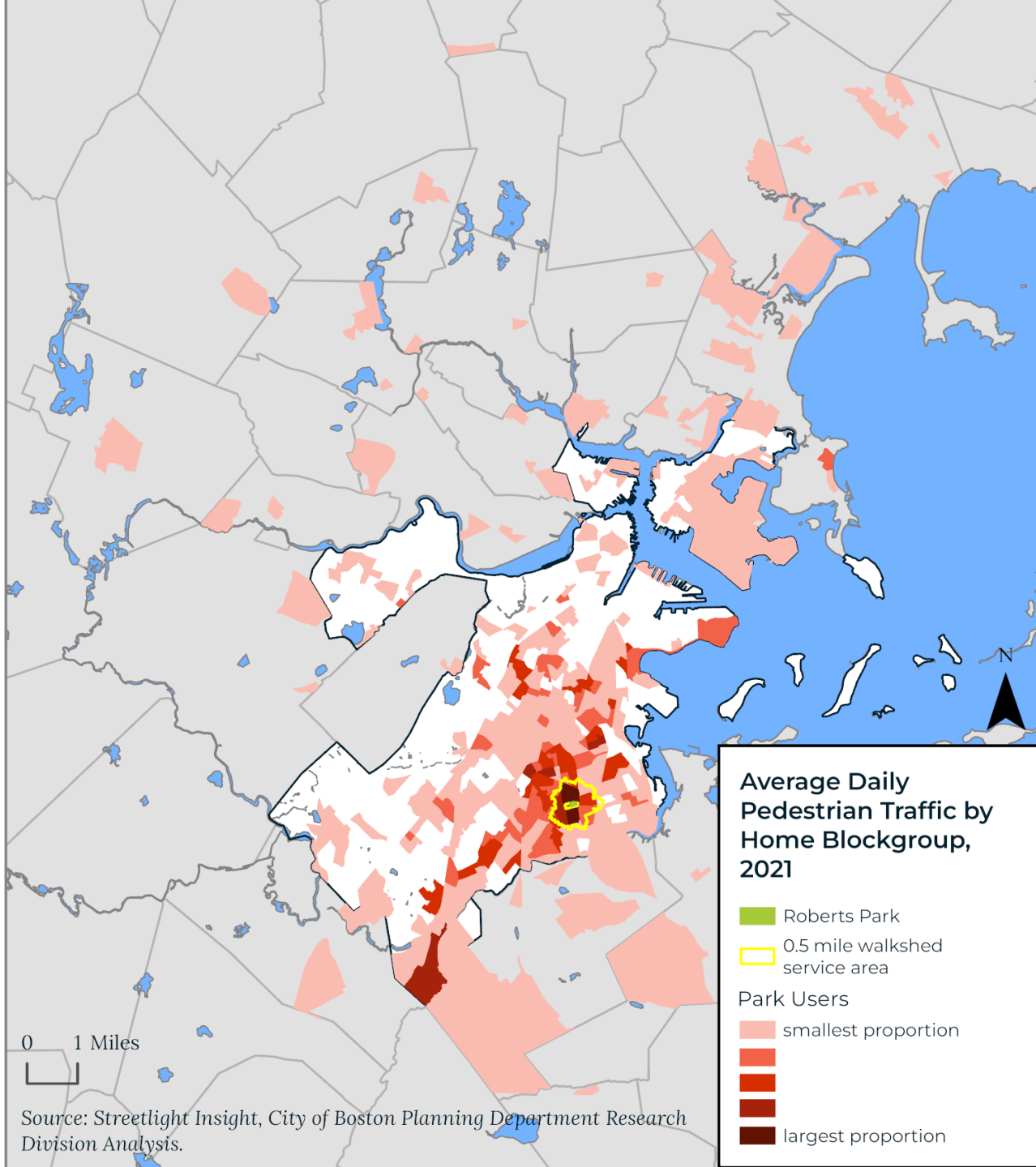


Source: Streetlight Insight, City of Boston Planning Department Research Division Analysis.

Where do Roberts Park users live?

31% of Roberts Park users* live within the 0.5 mile walkshed service area

*total restricted to the greater Boston area bounded by I-95



COMPARING DEMOGRAPHICS

Walkshed Residents vs Inferred Park User Home Locations

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BILLINGS FIELD

Demographic Comparison of Walkshed Residents and Park Users

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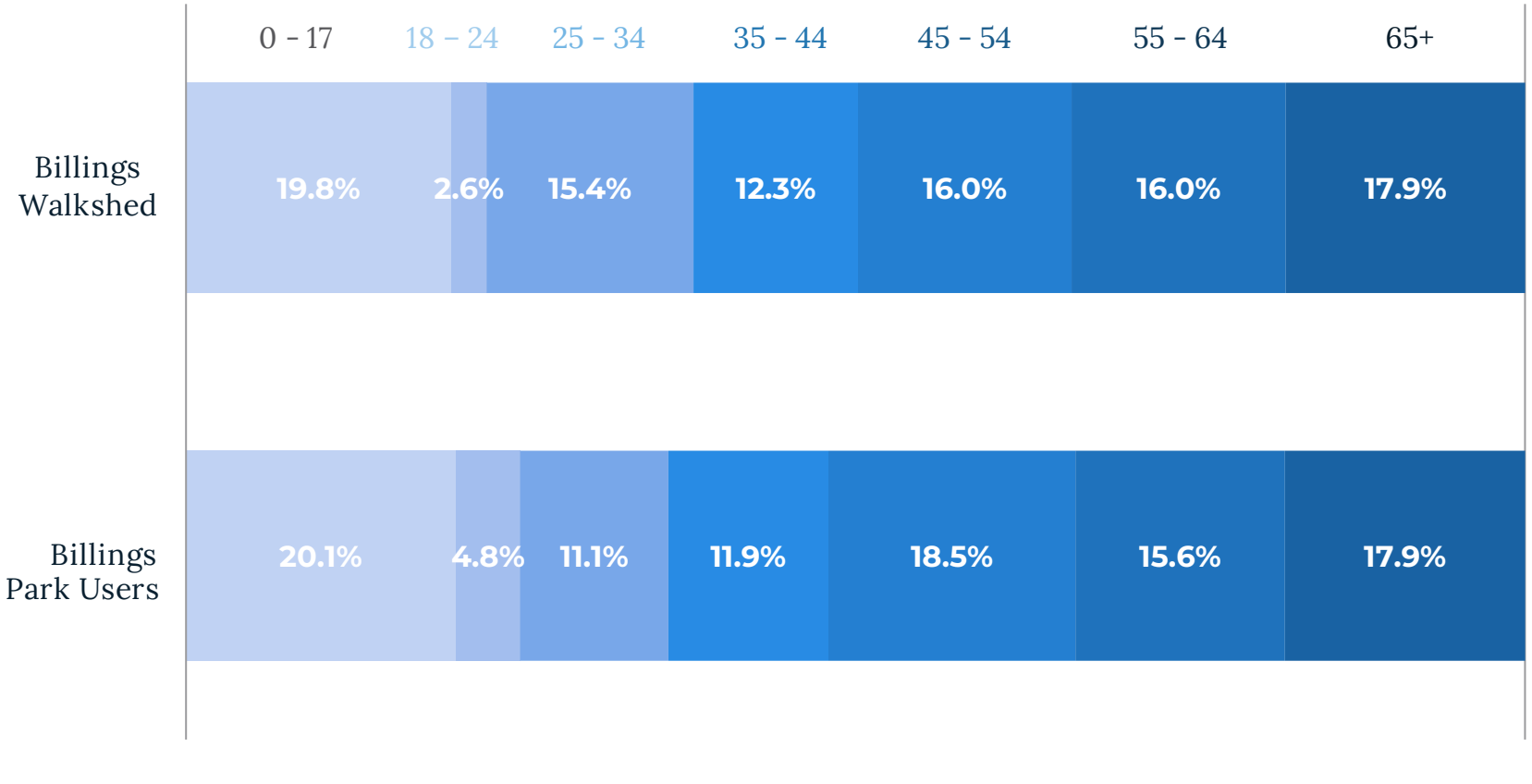
Planning Department

BILLINGS FIELD

WALKSHED RESIDENTS' AGE DISTRIBUTION WAS SIMILAR TO PARK USERS'

Walkshed Residents and Park Users by Age Group, 2021



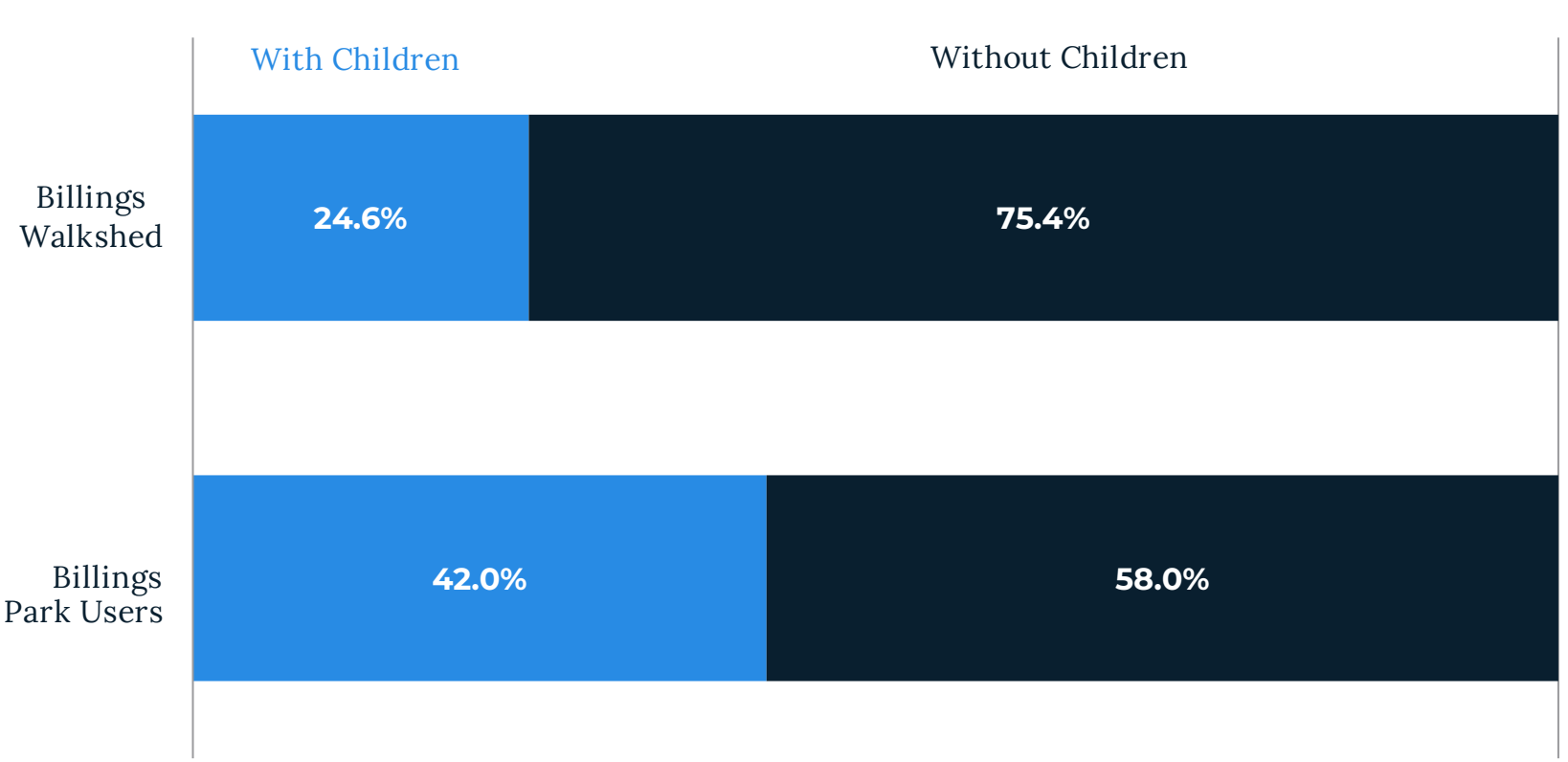
- Residents living in the 0.5 mile walkshed surrounding Billings were most likely aged 0-17 or 65+
- **Billings** park users were most likely aged 0 - 17 or 45 - 54 years.

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

BILLINGS FIELD

WALKSHED RESIDENTS ARE LESS LIKELY TO HAVE CHILDREN THAN PARK USERS

Walkshed Residents and Park Users by Household Composition Type, 2021



- 3 in 4 residents surrounding Billings Park did not have children.
- Slightly more than 2 in 4 Billings park users did not have children

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

BILLINGS FIELD

WALKSHED RESIDENTS TENDED TO HAVE HIGHER INCOMES THAN PARK USERS

Walkshed Residents and Park Users by Household Income Group, 2021

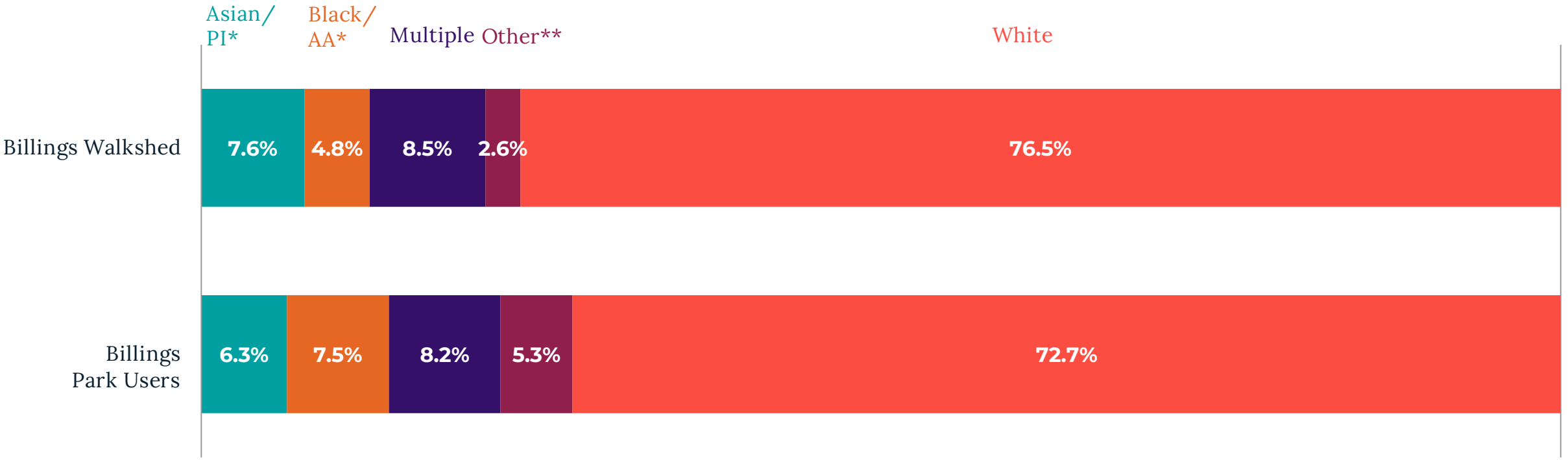
- **Half** of **Billings** park users report annual household incomes of **100k+ a year**
  - 1 in 3 report 150k+ a year
- Nearly **2 in 3** Billings walkshed residents reported an annual household income of **100k+ a year**
  - Nearly half reported household incomes of 150k+ a year

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

BILLINGS FIELD

WALKSHED RESIDENTS WERE MORE LIKELY TO BE WHITE OR ASIAN THAN PARK USERS

Walkshed Residents and Park Users by Race, 2021



Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

*PI = Pacific Islander, AA = African American **includes American Indian

Note: As Streetlight tabulates Hispanic ethnicity separately, individuals identifying as Hispanic are included in the stated racial groups.

BILLINGS FIELD

DEMOGRAPHICS CONTINUED

Walkshed Residents vs Park Users

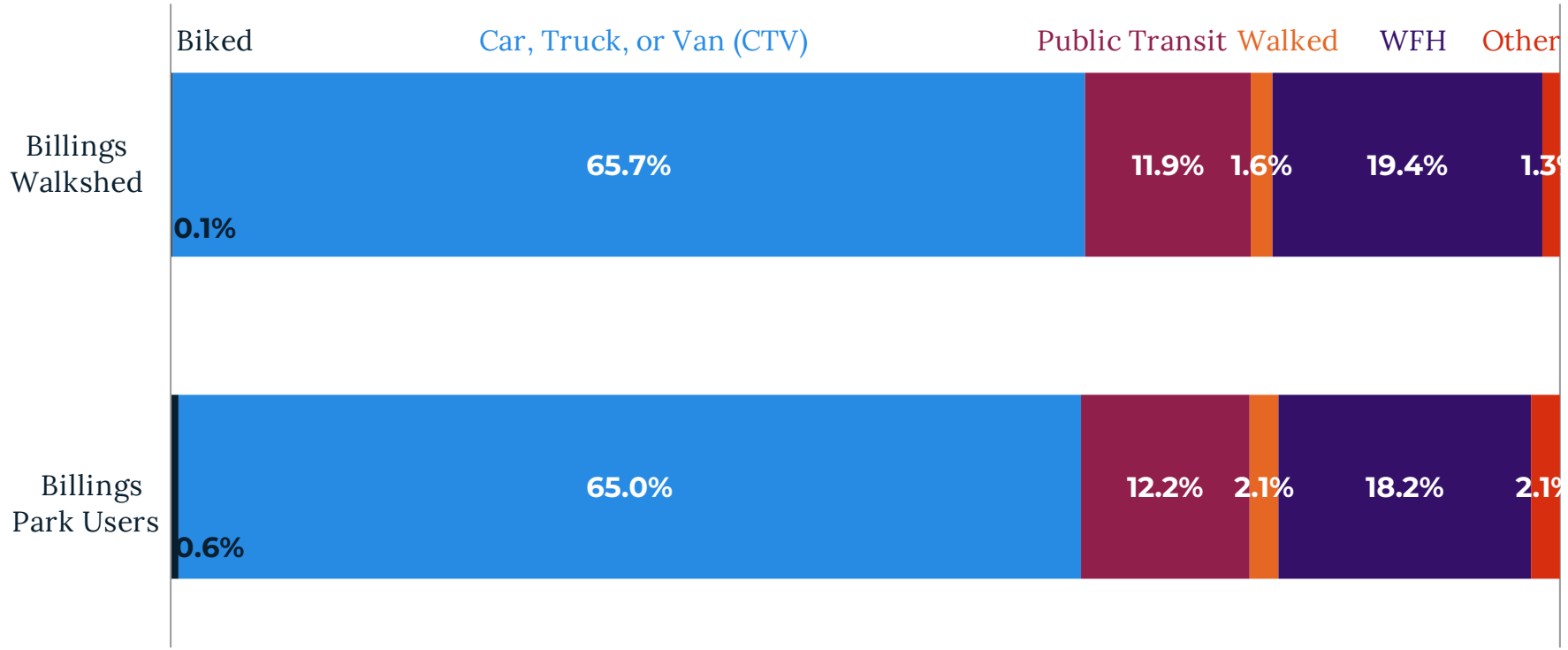
	WALKSHED *Residents*	BILLINGS *Park Users*
Foreign Born	19.2%	19.7%
English Level Speaking English "less than very well"	6.3%	1%
Hispanic Ethnicity	7.9%	10.6%
Renters	24.8%	30.6%
Disability	9.6%	10.9%

- Walkshed residents were less likely to:
  - Be foreign born
  - Be hispanic
  - Rent
  - Have a disability
- Walkshed residents were more likely to:
  - Speak English less than very well

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

WALKSHED RESIDENTS USED SIMILAR MEANS TO GET TO WORK AS PARK USERS

Walkshed Residents and Park Users by Means of Transportation to Work, 2021



Compared to park users:

- Walkshed residents were slightly more likely to:
  - Take a Car, Truck, or Van to work
  - Work from Home
- Walkshed residents were slightly less likely to:
  - Take public transit,
  - walk, or
  - take other means of transportation to work

Note: Other includes: Taxicab, Motorcycle, and 'Other means'.

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

BILLINGS FIELD

WALKSHED RESIDENTS HAD GREATER VEHICLE ACCESS THAN PARK USERS

	WALKSHED *Residents*	BILLINGS *Park Users*
No Vehicle	6.2%	10%
1 Vehicle	39.2%	38%
2+ Vehicles	41.8%	40.8%
3+ Vehicles	12.7%	11.2%

- Walkshed residents were less likely to have access to no vehicle than park users.
- Walkshed residents were more likely to have access to 1, 2, or 3 or more vehicles than park users.

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

BILLINGS FIELD

PARK USERS VS WALKSHED RESIDENTS

PARK USERS

- Users are most likely to be aged 0-17, White, make 150k+ a year, not have children, take a car truck or van to work, have access to 1 vehicle, and own their own home.
- **57%** live within the 0.5 mile walkshed service area.
- Park users were **more likely than walkshed residents** to:
  - Be foreign-born or Hispanic
  - Rent
  - Take public transit or walk to work
  - Have access to 0 vehicles
  - Have children
  - Have a disability

WALKSHED RESIDENTS

- Walkshed users' most likely demographic groups were the same as park users (see left)
- Walkshed residents were **more likely than park users** to:
  - Be White, Multiracial, or Asian/PI
  - Be aged 25-44 or 55 -64
  - Have a high annual household income
  - Speak English less than very well

CHRISTOPHER LEE

Demographic Comparison of Walkshed Residents and Park Users

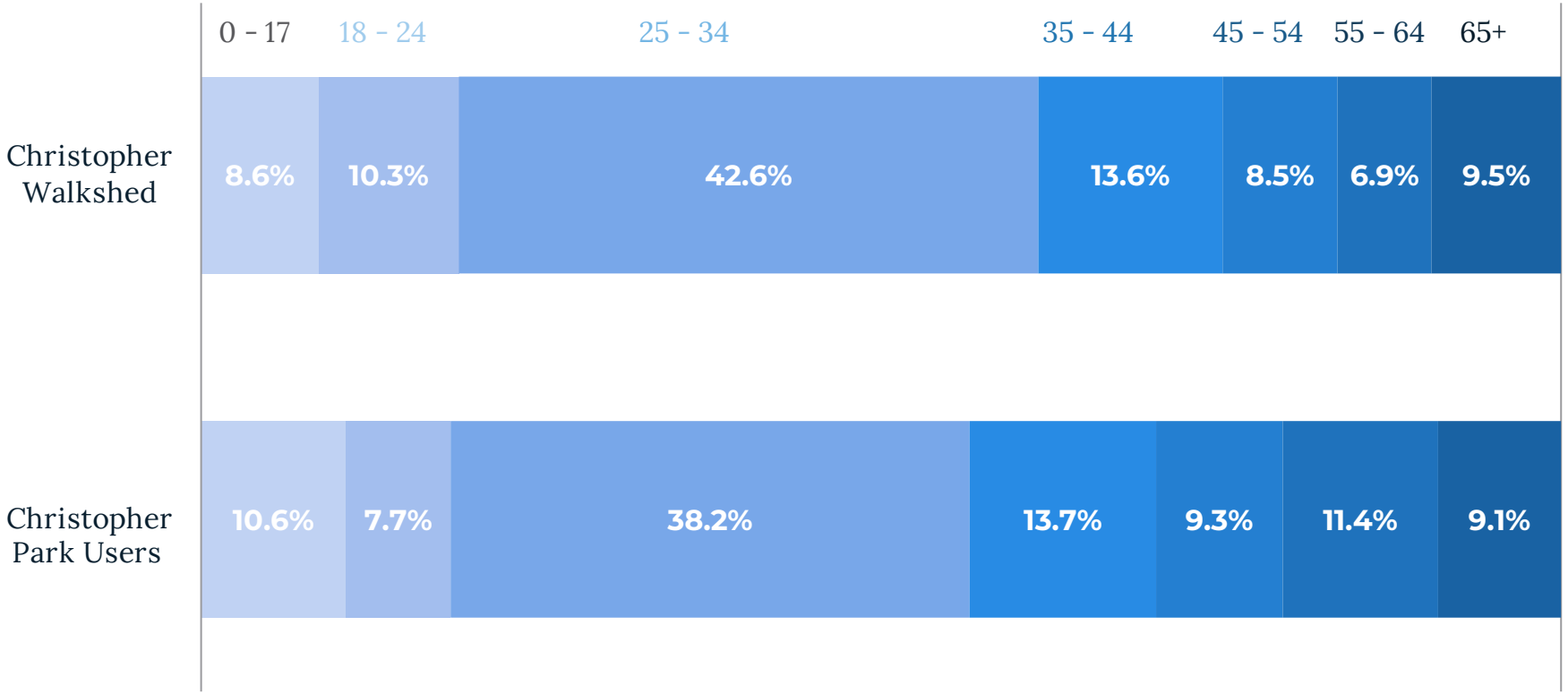
RESEARCH DIVISION

City of Boston
Planning Department

CHRISTOPHER LEE PLAYGROUND

WALKSHED RESIDENTS WERE MORE LIKELY TO BE AGED 25-34 THAN PARK USERS

Walkshed Residents and Park Users by Age Group, 2021

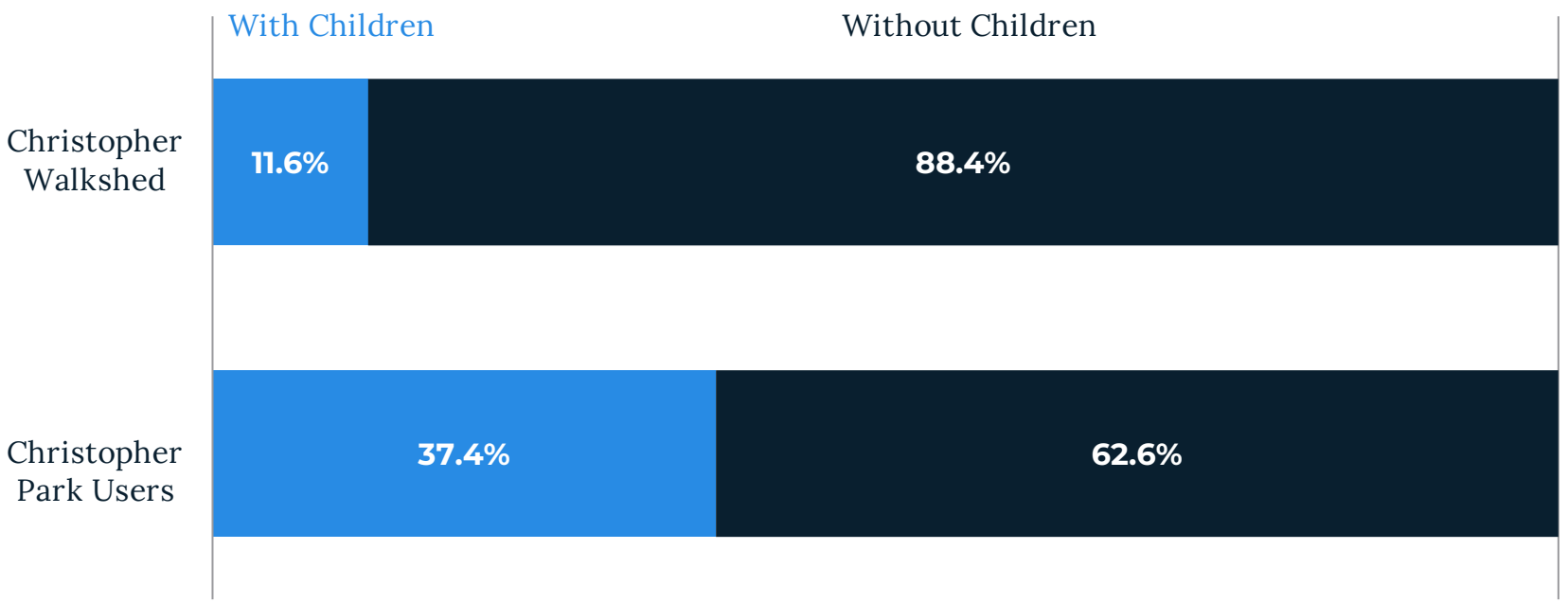


- Christopher Lee park users were overall slightly older than Christopher Lee walkshed residents
- Residents living in the 0.5 mile walkshed surrounding Christopher Lee were most likely aged 25-34
- **Christopher Lee** park users are most likely aged 25 - 34 years.

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

WALKSHED RESIDENTS ARE LESS LIKELY TO HAVE CHILDREN THAN PARK USERS

Walkshed Residents and Park Users by Household Composition Type, 2021



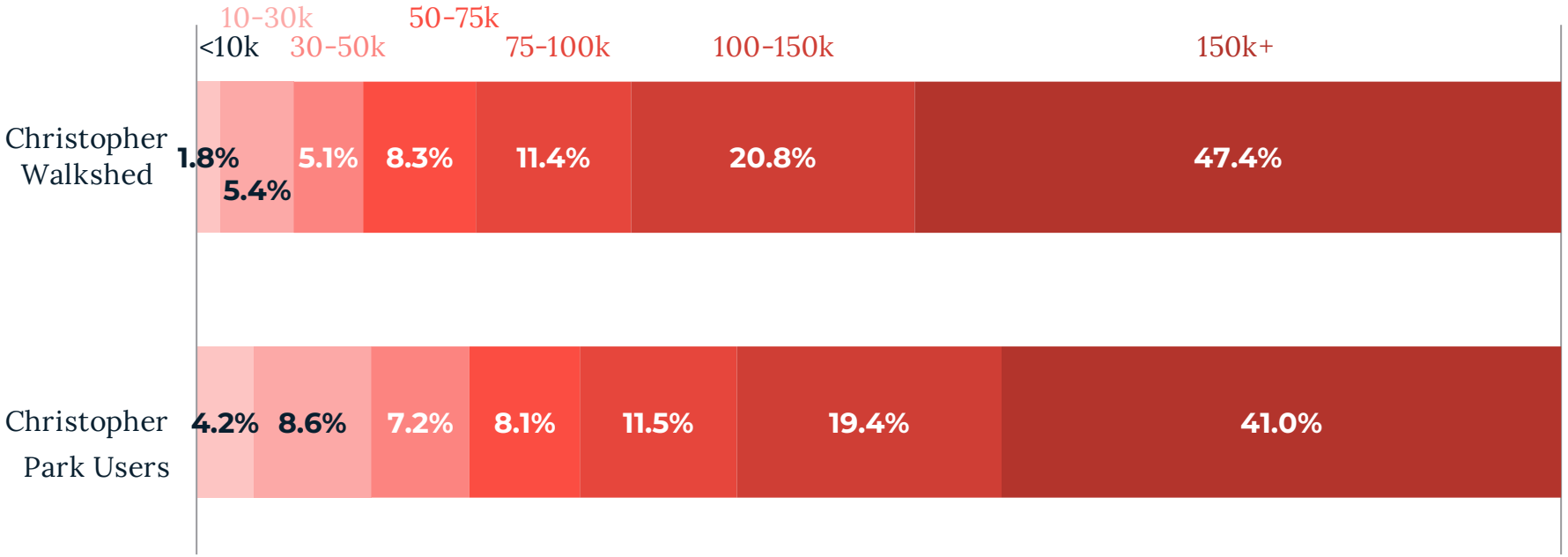
- Nearly 90% of Christopher Lee park walkshed residents do not have children in their household
- More than 1 in 3 Christopher Lee park users have children in their household

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

CHRISTOPHER LEE PLAYGROUND

WALKSHED RESIDENTS TENDED TO HAVE HIGHER INCOMES THAN PARK USERS

Walkshed Residents and Park Users by Household Income Group, 2021



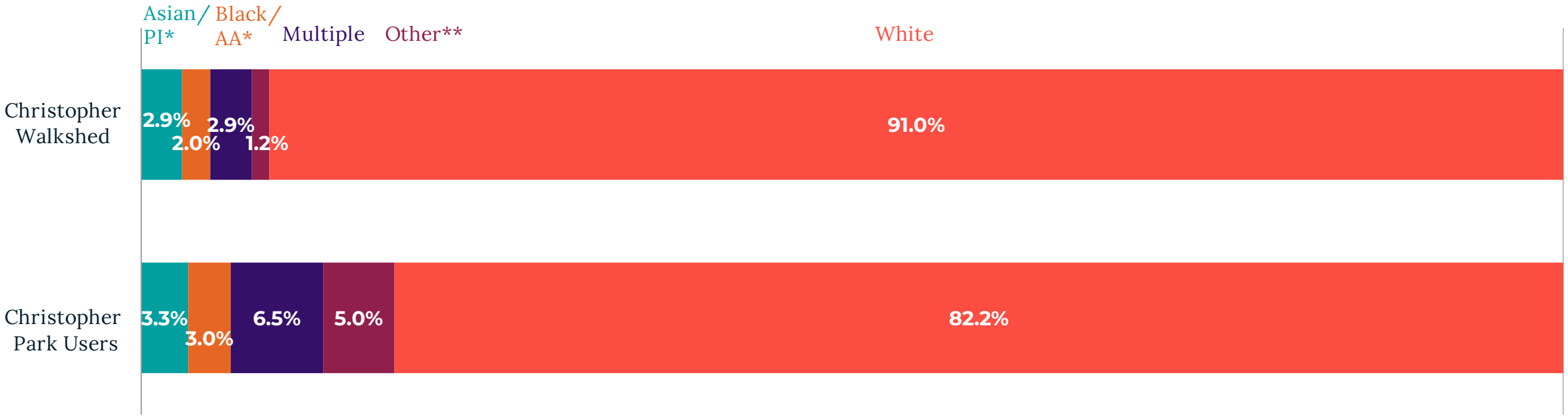
- Nearly half of Christopher Lee walkshed residents reported household incomes of 150k+ a year
  - 2 in 3 reported an income of 100k+ a year
- 60% of Christopher Lee Park users report household incomes of 100k+ a year
  - 2 in 5 report 150k+ a year

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

CHRISTOPHER LEE PLAYGROUND

WALKSHED RESIDENTS WERE MORE LIKELY TO BE WHITE THAN PARK USERS

Walkshed Residents and Park Users by Race, 2021



Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

**PI = Pacific Islander, AA = African American **includes American Indian*

Note: As Streetlight tabulates Hispanic ethnicity separately, individuals identifying as Hispanic are included in the stated racial groups.

CHRISTOPHER LEE PLAYGROUND

DEMOGRAPHICS CONTINUED

Walkshed Residents vs Park Users

	WALKSHED *Residents*	CHRISTOPHER LEE *Park Users*
Foreign Born	6.2%	10.7%
English Level Speaking English "less than very well"	1.5%	0.5%
Hispanic Ethnicity	4.1%	6.6%
Renters	47.9%	49.4%
Disability	6.4%	8.5%

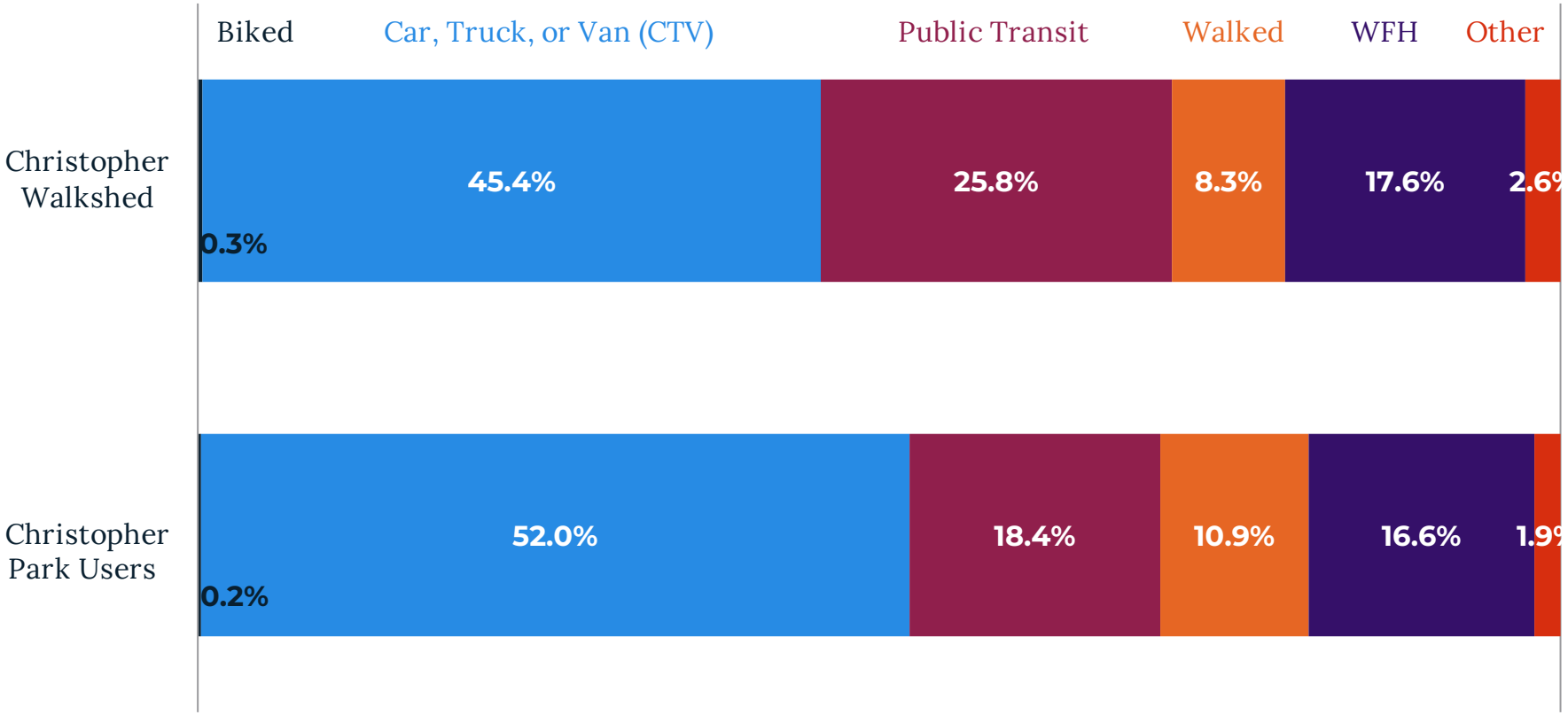
- Walkshed residents were less likely to:
  - Be foreign born
  - Be Hispanic
  - Rent
  - Have a disability
- Walkshed residents were more likely to:
  - Speak English less than very well

City of Boston

CHRISTOPHER LEE PLAYGROUND

WALKSHED RESIDENTS WERE MORE LIKELY TO TAKE PUBLIC TRANSIT TO WORK

Walkshed Residents and Park Users by Means of Transportation to Work, 2021



Compared to park users:

- Walkshed residents were more likely to:
  - take public transit or other means of transportation to work or
  - work from home
- Walkshed residents were slightly less likely to:
  - take a car, truck, or van or
  - walk to work

Note: Other includes: Taxicab, Motorcycle, and 'Other means'.

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

CHRISTOPHER LEE PLAYGROUND

WALKSHED RESIDENTS WERE SLIGHTLY LESS LIKELY TO HAVE ACCESS TO NO OR 3+ VEHICLES

	WALKSHED *Residents*	CHRISTOPHER LEE *Park Users*
No Vehicle	17.2%	17.6%
1 Vehicle	46.9%	44.2%
2 Vehicles	29.8%	27.8%
3+ Vehicles	6.0%	10.4%

- Walkshed residents were less likely to have access to no vehicle or 3+ vehicles.
- Walkshed residents were more likely to have access to 1 or 2 vehicles than park users.

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

CHRISTOPHER LEE PLAYGROUND

PARK USERS VS WALKSHED RESIDENTS

PARK USERS

- Users are most likely to be aged 25-34, White, make 150k+ a year, not have children, take a car truck or van to work, have access to 1 vehicle, and own their own home.
- **60%** live within the 0.5 mile walkshed service area.
- Park users were **more likely than walkshed residents** to:
  - Be foreign born, Hispanic, or renters
  - Take a car, truck, or van or walk to work
  - Have access to no vehicle or 3+ vehicles
  - Have a disability

WALKSHED RESIDENTS

- Walkshed users' most likely demographic groups were the same as park users (see left)
- Walkshed residents were **more likely than park users** to:
  - Be white and aged 25-34
  - Have a high annual household income
  - Not have children
  - Speak English less than very well
  - Take public transit to work or work from home
  - Have access to 1 or 2 vehicles

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

NOYES

Demographic Comparison of Walkshed Residents and Park Users

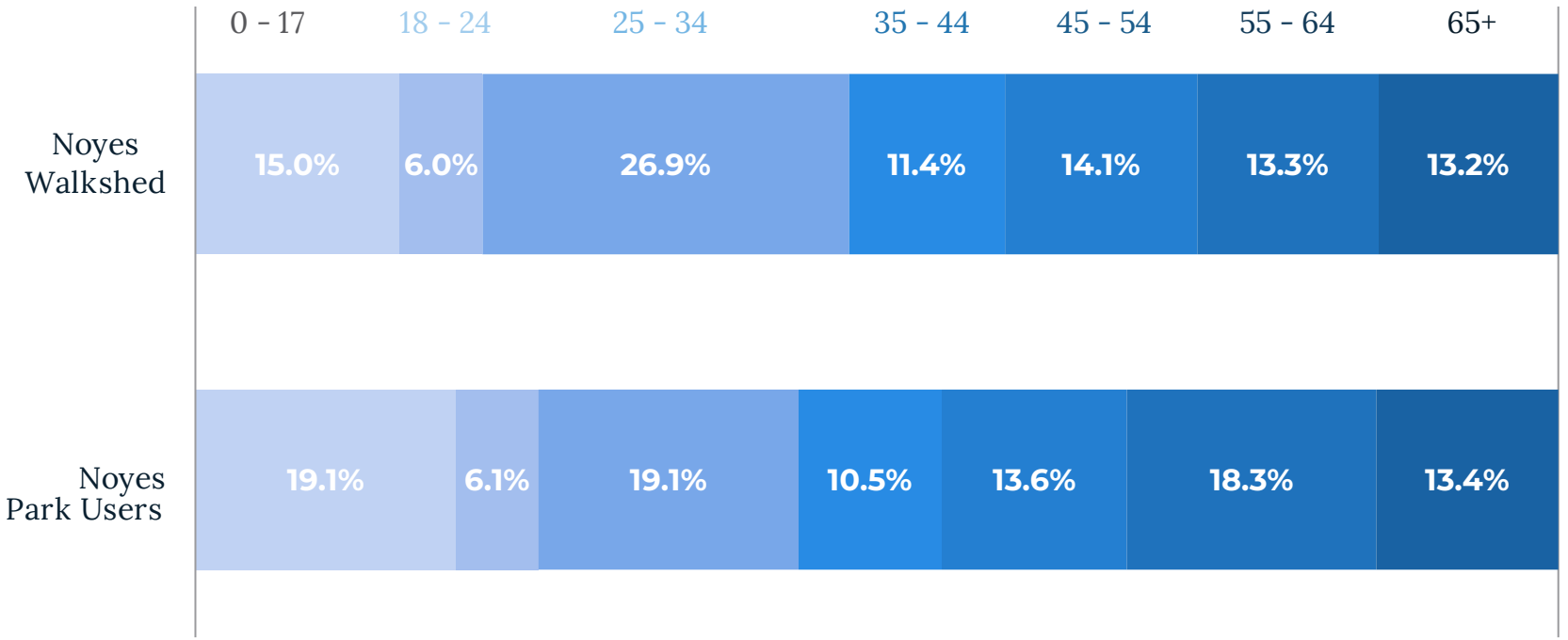
RESEARCH DIVISION

City of Boston
Planning Department

NOYES PLAYGROUND

WALKSHED RESIDENTS WERE MORE LIKELY TO BE AGED 25-34

Walkshed Residents and Park Users by Age Group, 2021



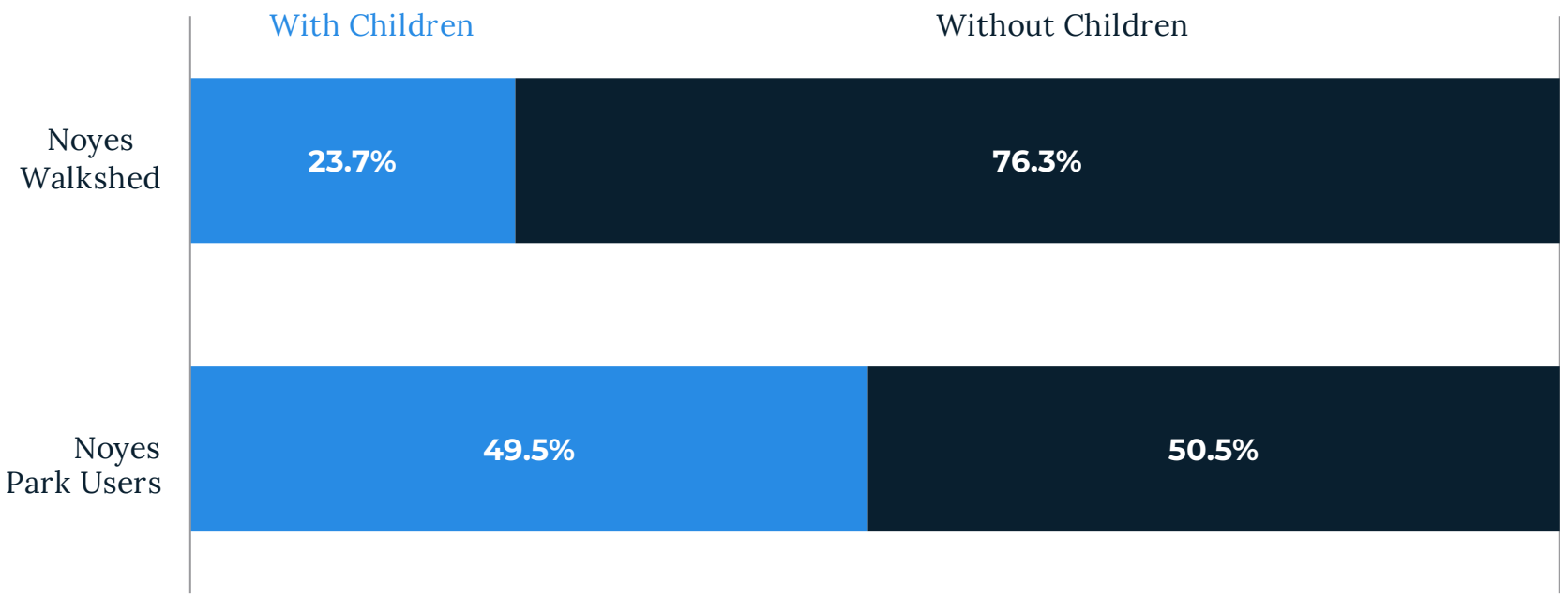
- Residents living in the 0.5 mile walkshed surrounding Noyes were most and more likely than park users to be aged 25-34
- **Noyes** park users are most likely aged 0 – 17 or 25 – 34.

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

NOYES PLAYGROUND

WALKSHED RESIDENTS ARE LESS LIKELY TO HAVE CHILDREN THAN PARK USERS

Walkshed Residents and Park Users by Household Composition Type, 2021



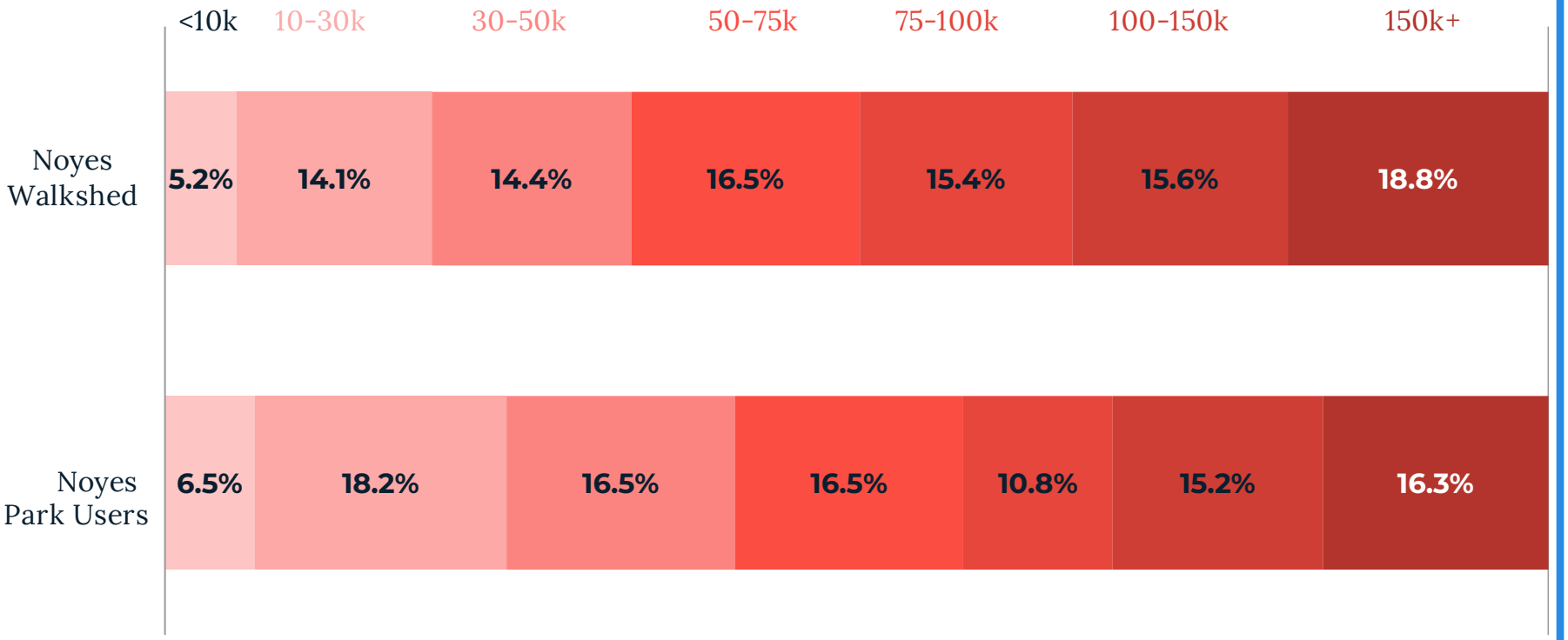
- 3 in 4 Noyes walkshed residents do not have children in their household
- Half of Noyes park users do not have children

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

NOYES PLAYGROUND

WALKSHED RESIDENTS TENDED TO HAVE HIGHER INCOMES THAN PARK USERS

Walkshed Residents and Park Users by Household Income Group, 2021



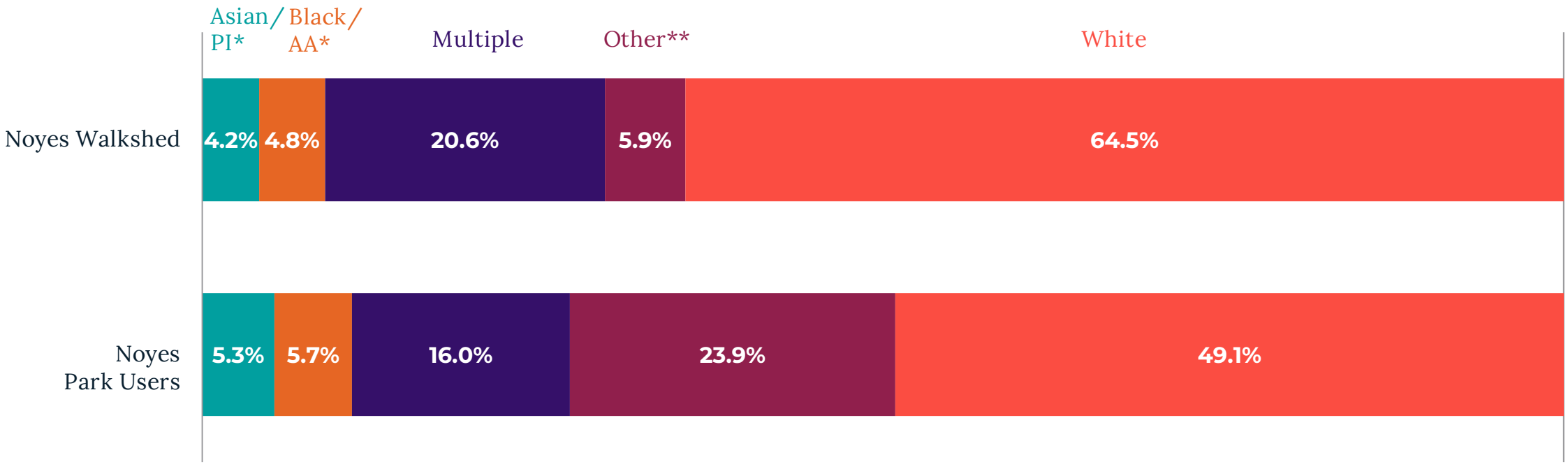
- 66% of Noyes walkshed residents report annual household incomes of 50k or greater
  - 1 in 3 report household incomes less than 50k
- Over half of Noyes park users report household incomes of 75k a year or lower.
  - 40% report household incomes less than 50k

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

NOYES PLAYGROUND

WALKSHED RESIDENTS MORE LIKELY TO BE WHITE OR MULTIRACIAL

Walkshed Residents and Park Users by Race, 2021



Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

*PI = Pacific Islander, AA = African American **includes American Indian

Note: As Streetlight tabulates Hispanic ethnicity separately, individuals identifying as Hispanic are included in the stated racial groups.

DEMOGRAPHICS CONTINUED

Walkshed Residents vs Park Users

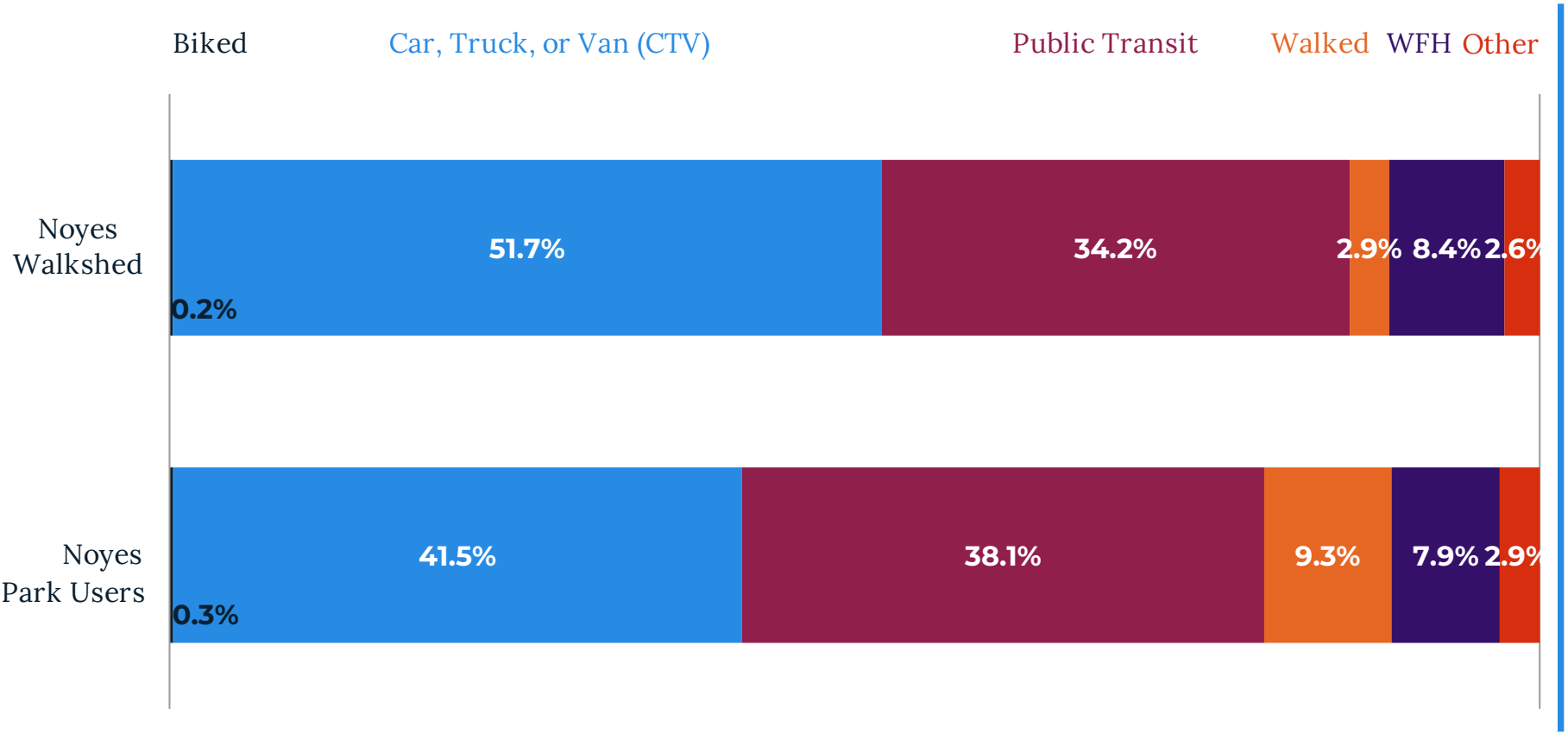
	WALKSHED *Residents*	NOYES *Park Users*
Foreign Born	39.9%	35.7%
English Level Speaking English "less than very well"	31.6%	29%
Hispanic Ethnicity	44.6%	38.6%
Renters	64.5%	60.3%
Disability	11.0%	12.3%

- Walkshed residents were less likely to:
  - Have a disability
- Walkshed residents were more likely to:
  - Be foreign-born
  - Speak English less than very well
  - Be Hispanic
  - Rent

NOYES PLAYGROUND

WALKSHED RESIDENTS WERE MORE LIKELY TO TAKE A CTV TO WORK OR WFH

Walkshed Residents and Park Users by Means of Transportation to Work, 2021



Compared to park users:

- Walkshed residents were more likely to:
  - Take a car, truck, or van to work
  - Work from home
- Walkshed residents were slightly less likely to:
  - Take public transit or other means of transportation to work
  - Walk to work

Note: Other includes: Taxicab, Motorcycle, and 'Other means'.

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

NOYES PLAYGROUND

WALKSHED RESIDENTS WERE LESS LIKELY TO HAVE ACCESS TO 2 VEHICLES

	WALKSHED *Residents*	NOYES *Park Users*
No Vehicle	24.4%	22.1%
1 Vehicle	42.2%	38.1%
2 Vehicles	24.5%	35.2%
3+ Vehicles	8.9%	4.5%

- Walkshed residents were less likely to have access to 2 vehicles
- Walkshed residents were more likely to have access to no vehicle, 1 vehicle, or 3+ vehicles

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

NOYES PLAYGROUND

PARK USERS VS WALKSHED RESIDENTS

PARK USERS

- Users were most likely to be aged 0-17, White, make 10-30k a year, not have children, take a car truck or van to work, have access to 1 vehicle, and rent.
- **34%** live within the 0.5 mile walkshed service area
- Park users were **more likely than walkshed residents** to:
  - Have a disability
  - Take public transit or walk to work

WALKSHED RESIDENTS

- Walkshed residents were most likely to be aged 25-34, White, make 150k+ a year, not have children, take a car truck or van to work, have access to 1 vehicle, and rent.
- Walkshed residents were **more likely than park users** to:
  - Be White, Multiracial, foreign-born, Hispanic, or aged 25-34
  - Have a high household income and no children
  - Speak English less than very well
  - Take a car, truck, or van to work or work from home
  - Have access to 0, 1, or 3+ vehicles
  - Rent

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

ROBERTS

Demographic Comparison of Walkshed Residents and Park Users

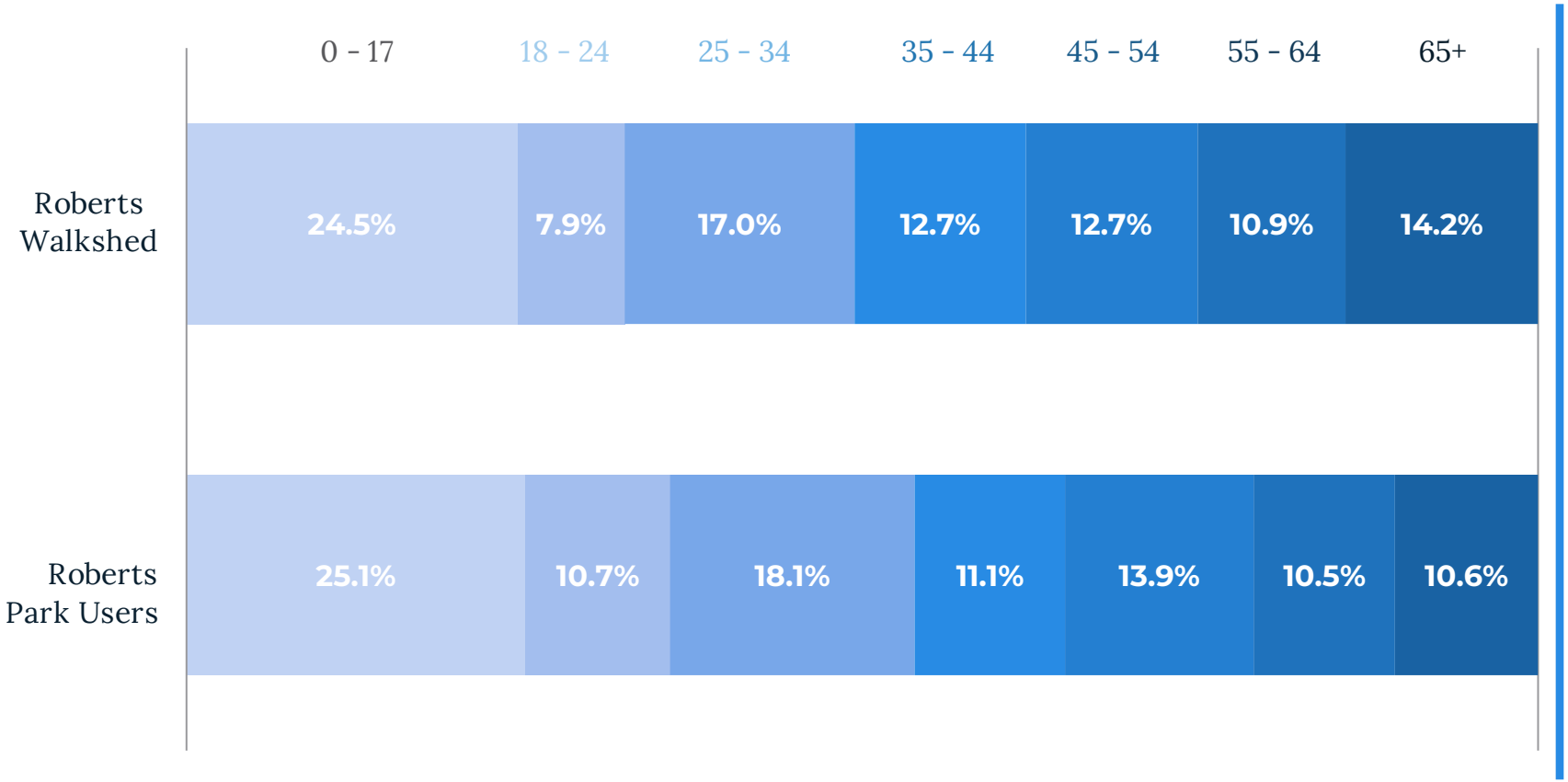
RESEARCH DIVISION

City of Boston
Planning Department

ROBERTS PLAYGROUND

WALKSHED RESIDENTS' AGE DISTRIBUTION WAS SIMILAR TO PARK USERS'

Walkshed Residents and Park Users by Age Group, 2021

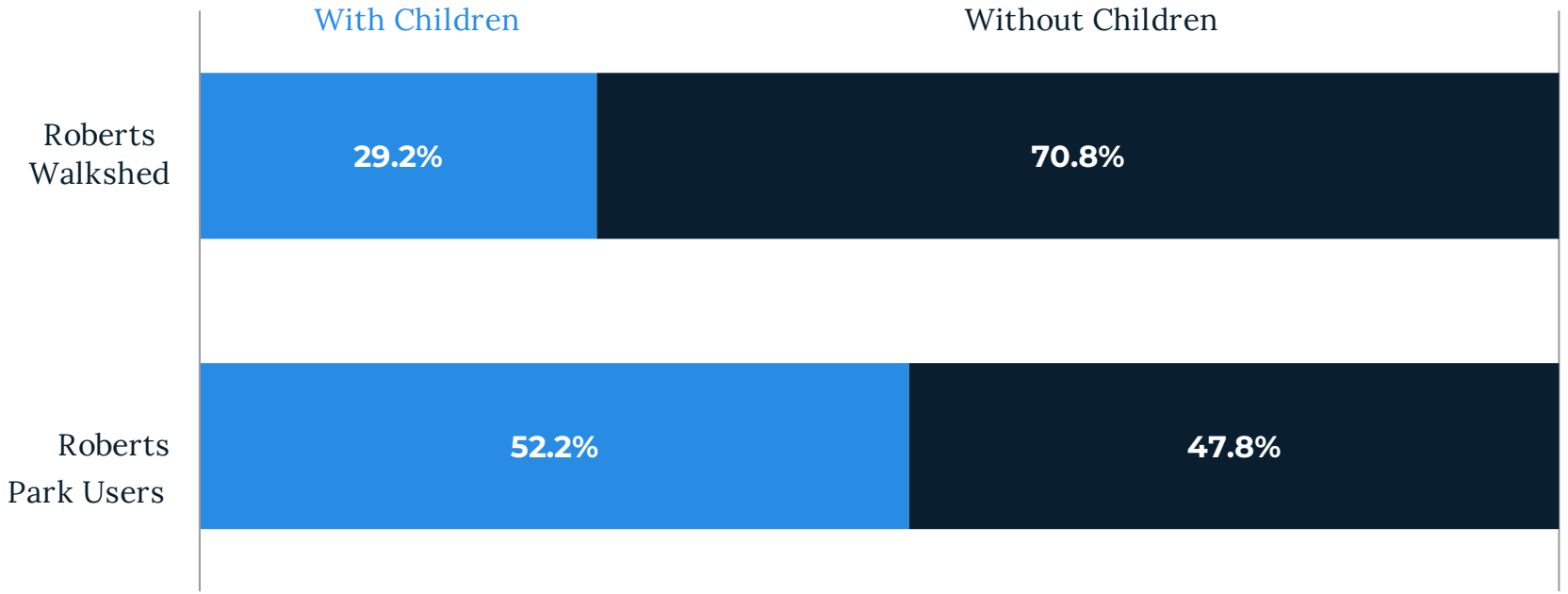


- Residents living in the 0.5 mile walkshed surrounding Roberts were most likely to be aged 0-17
- **Roberts** park users are most likely aged 0-17

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

WALKSHED RESIDENTS ARE LESS LIKELY TO HAVE CHILDREN THAN PARK USERS

Walkshed Residents and Park Users by Household Composition Type, 2021



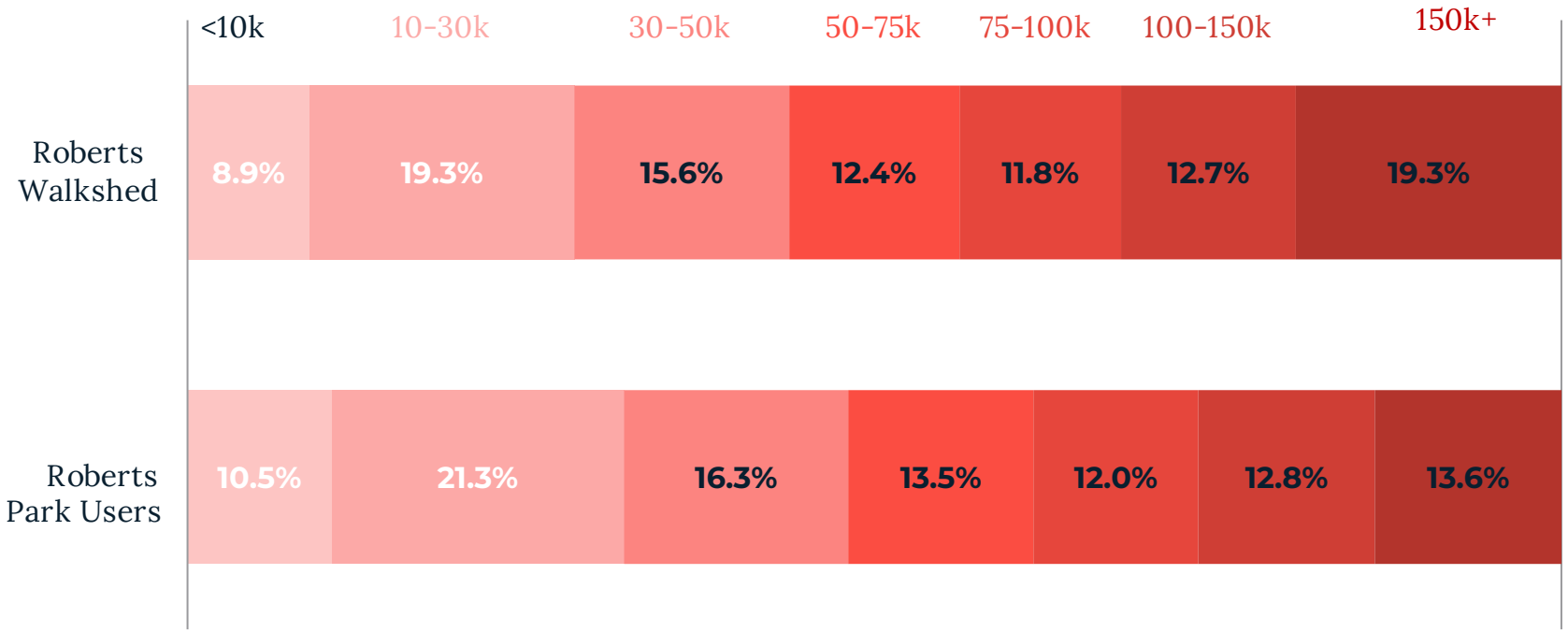
- Nearly 3 in 4 Roberts walkshed residents do not have children in their household
- Around half of Roberts park users have children in their household

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

ROBERTS PLAYGROUND

WALKSHED RESIDENTS TENDED TO HAVE HIGHER INCOMES THAN PARK USERS

Walkshed Residents and Park Users by Household Income Group, 2021



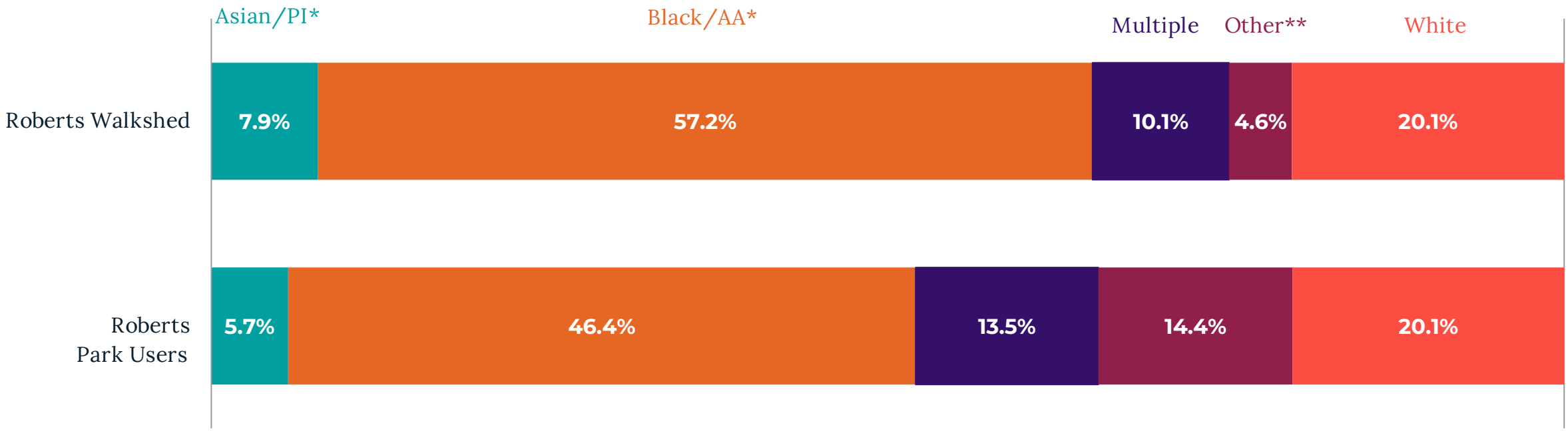
- 44% of Roberts walkshed residents report household incomes of 75k a year or higher
  - 44% report household incomes of less than 50k
- 38% of Roberts park users report household incomes of 75k a year or higher.
  - Nearly half report household incomes of less than 50k

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

ROBERTS PLAYGROUND

WALKSHED RESIDENTS WERE MORE LIKELY TO BE BLACK/AA OR ASIAN/PI*

Walkshed Residents and Park Users by Race, 2021



Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

*PI = Pacific Islander, AA = African American **includes American Indian

Note: As Streetlight tabulates Hispanic ethnicity separately, individuals identifying as Hispanic are included in the stated racial groups.

RESEARCH DIVISION

DEMOGRAPHICS CONTINUED

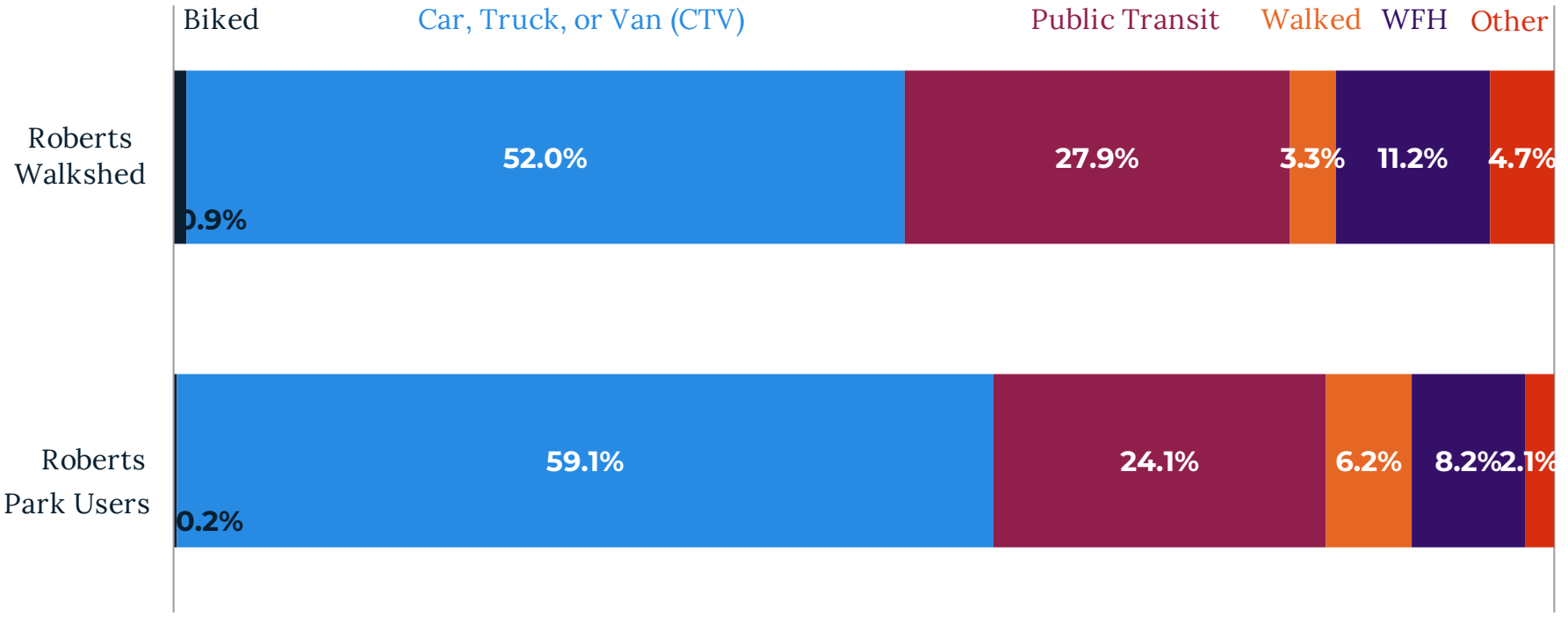
Walkshed Residents vs Park Users

	WALKSHED *Residents*	ROBERTS *Park Users*
Foreign Born	32.4%	30.8%
English Level Speaking English "less than very well"	16.8%	19%
Hispanic Ethnicity	15.9%	23%
Renters	56.2%	61.8%
Disability	18.5%	15.7%

- Walkshed residents were less likely to:
  - Speak English less than very well
  - Be Hispanic
  - Be Renters
- Walkshed residents were more likely to:
  - Be foreign-born
  - Have a disability

WALKSHED RESIDENTS WERE MORE LIKELY TO TAKE PUBLIC TRANSIT TO WORK THAN PARK USERS

Walkshed Residents and Park Users by Means of Transportation to Work, 2021



Compared to park users:

- Walkshed residents were slightly more likely to:
  - Take public transit or bike to work
  - Work from home
- Walkshed residents were slightly less likely to:
  - Take a car, truck, or van to work
  - Walk to work

Note: Other includes: Taxicab, Motorcycle, and 'Other means'.

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

ROBERTS PLAYGROUND

WALKSHED RESIDENTS HAD ACCESS TO MORE VEHICLES THAN PARK USERS

	WALKSHED *Residents*	ROBERTS *Park Users*
No Vehicle	28%	30%
1 Vehicle	38.0%	40.6%
2 Vehicles	24.6%	21.9%
3+ Vehicles	9.4%	7.9%

- Walkshed residents were less likely to have access to 0 – 1 vehicles than park users.
- Walkshed residents were more likely to have access to 2 or 3+ vehicles than park users.

Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

PARK USERS VS WALKSHED RESIDENTS

PARK USERS

- Users are most likely to be aged 0-17, Black or African American, make 10-30k a year, have children, take a car truck or van to work, have access to 1 vehicle, and rent.
- **31%** live within the 0.5 mile walkshed service area
- Park users were **more likely than walkshed residents** to:
  - Be Hispanic
  - Rent
  - Speak English less than very well
  - Take a car, truck, or van to work
  - Have children

WALKSHED RESIDENTS

- Walkshed residents were most likely to be aged 0-17, Black or African American, make 10-30k or 150k+ a year, not have children, take a car truck or van to work, have access to 1 vehicle, and rent.
- Walkshed residents were **more likely than park users** to:
  - Be Black, Asian, or foreign-born
  - Have a high household income and no children
  - Take public transit or work from home
  - Have access to 2 or 3+ vehicles
  - Have a disability

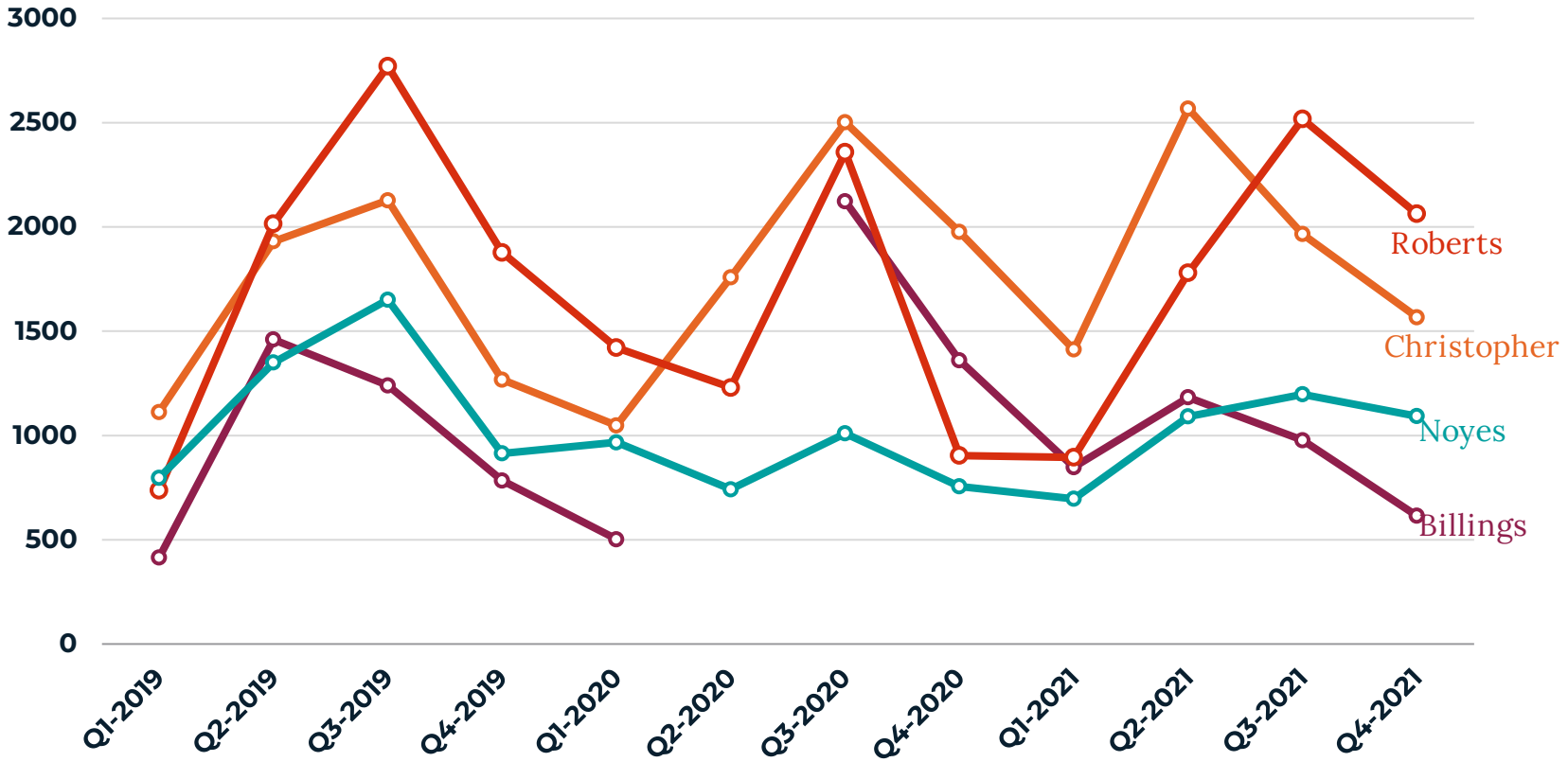
Source: Streetlight Insight; U.S. Census Bureau, American Community Survey 2017 - 2021; City of Boston Planning Department Research Division Analysis.

PARKS PROJECT PT.2

1. INTRODUCTION
2. CHARACTERIZING PARK USAGE
   Billings, Christopher, Noyes, Roberts
3. CHARACTERIZING PARK USERS
   Billings, Christopher, Noyes, Roberts
4. CHARACTERIZING PARK CONTEXT
5. CONCLUSION

Park Visitorship 2019 -2021 for Roberts, Christopher, Noyes, and Billings Parks

Average Daily Zone Traffic by Year by 3 Mo Increment, 2019 - 2021



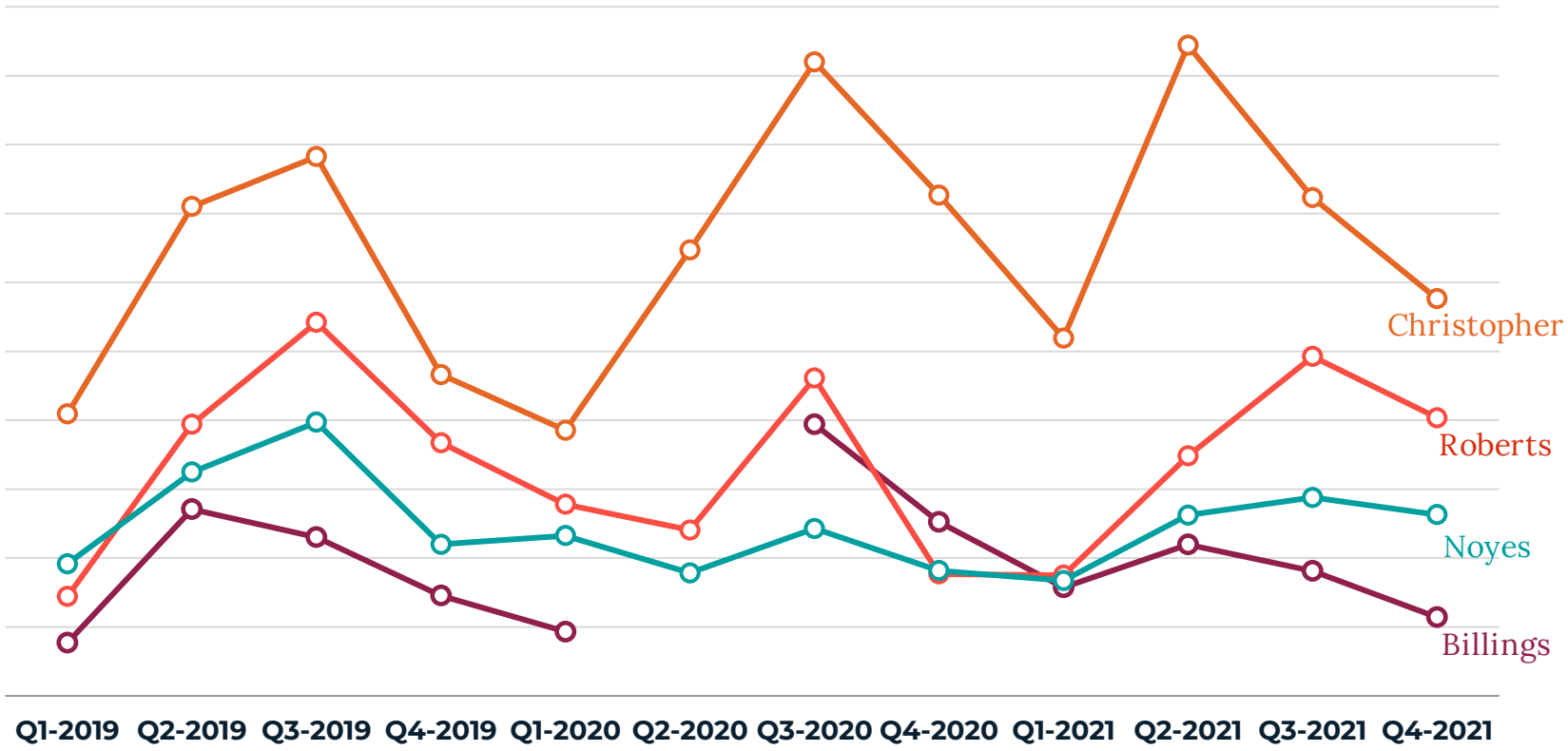
- **Christopher Lee** and **Roberts** parks appear to have the highest average daily pedestrian traffic.

Note: Billings had missing data for Q2 2020

Source: Streetlight Insight. City of Boston Planning Department Research Division Analysis.

Christopher Lee Playground is the most used when adjusted for size

Acreage-Adjusted Average Daily Zone Traffic by Year by 3 mo increment, 2019 - 2021



- When adjusted for size, **Christopher Lee** has the most activity, followed by **Roberts**, then **Noyes** and **Billings**.
- Christopher Lee appears significantly more trafficked when adjusted for size.
- Measuring park usage by average daily zone traffic (stoppers & passers), **Christopher Lee** park is the most 'used'

Note: Billings had missing data for Q2 2020

Source: Streetlight Insight, City of Boston Planning Department Research Division Analysis.

Internal Park Context and Usage

What does the literature say about how internal park aspects may relate to usage patterns?

1

Recreation Facilities

Playgrounds, dog parks, spray play, etc.

2

Inclusiveness

Accessibility ramps, benches, drinking fountains, restrooms

3

Green & Blue Infrastructure

Landscaping, presence of water, tree canopy coverage, etc.

4

Flexibility of Movement

Number of entrances, paths, etc.

Sources: Lee 2018, Bahriny and Bell 2020, Kongphunphin and Srivanit 2021, Zeng and Liu 2023.

Internal Context

Movement Flexibility, Green & Blue Infrastructure

	BILLINGS *West Roxbury*	CHRISTOPHER *South Boston*	NOYES *East Boston*	ROBERTS *Dorchester*
Tree Canopy Coverage	22.1%	3.2%	8.1%	10.6%
Water Coverage	0%	0%	0%	0%
Water Feature	1 Spray Play	0	1 Spray Play	1 Spray Play
# Entrances	4	5	6	6

Sources: BPRD, City of Boston Planning Department Research Division Analysis.

Internal Context

Recreational Facilities

Map of Park Assets

Source: BPRD, City of Boston Planning Department Research Division.

	Christopher Lee	Billings
Basketball Courts	1	2
Athletic Fields	3	4
Spray Play	0	1
Play grounds	1	1
Dog Parks	0	0
Tennis Courts	0	4
Total Facilities	**5**	**12**

Internal Context

Recreational Facilities

Map of Park Assets

Source: BPRD, City of Boston Planning Department Research Division.

	Roberts	Noyes
Basketball Courts	2	2
Athletic Fields	2	3
Spray Play	1	1
Play grounds	1	1
Dog Parks	0	0
Tennis Courts	0	0
Futsal	0	1
Total Facilities	**6**	**8**

Internal Context

Inclusiveness

Map of Park Assets

Source: BPRD, City of Boston Planning Department Research Division.

	Christopher Lee	Billings
Benches	3	16
Player Benches	8	9
Drinking Fountains	0	2
Tables	0	2
Restrooms	0	0
Total Assets	**11**	**29**

Internal Context

Inclusiveness

Map of Park Assets

Source: BPRD, City of Boston Planning Department Research Division.

	Roberts	Noyes
Benches	11	8
Player Benches	11	13
Drinking Fountains	3	2
Tables	4	3
Restrooms	0	0
Total Assets	**29**	**26**

City of Boston

External Park Context and Usage

What does the literature say about how external park context may relate to usage patterns?

1

Surrounding Land Use

% commercial, % multi-family residential, %single-family, etc.

2

Surrounding Open Space

Presence of other open spaces near the park

3

Transportation Infrastructure

of transport modes to get to there, bus stops, subway, light rail nearby

4

Pedestrian Oriented Design

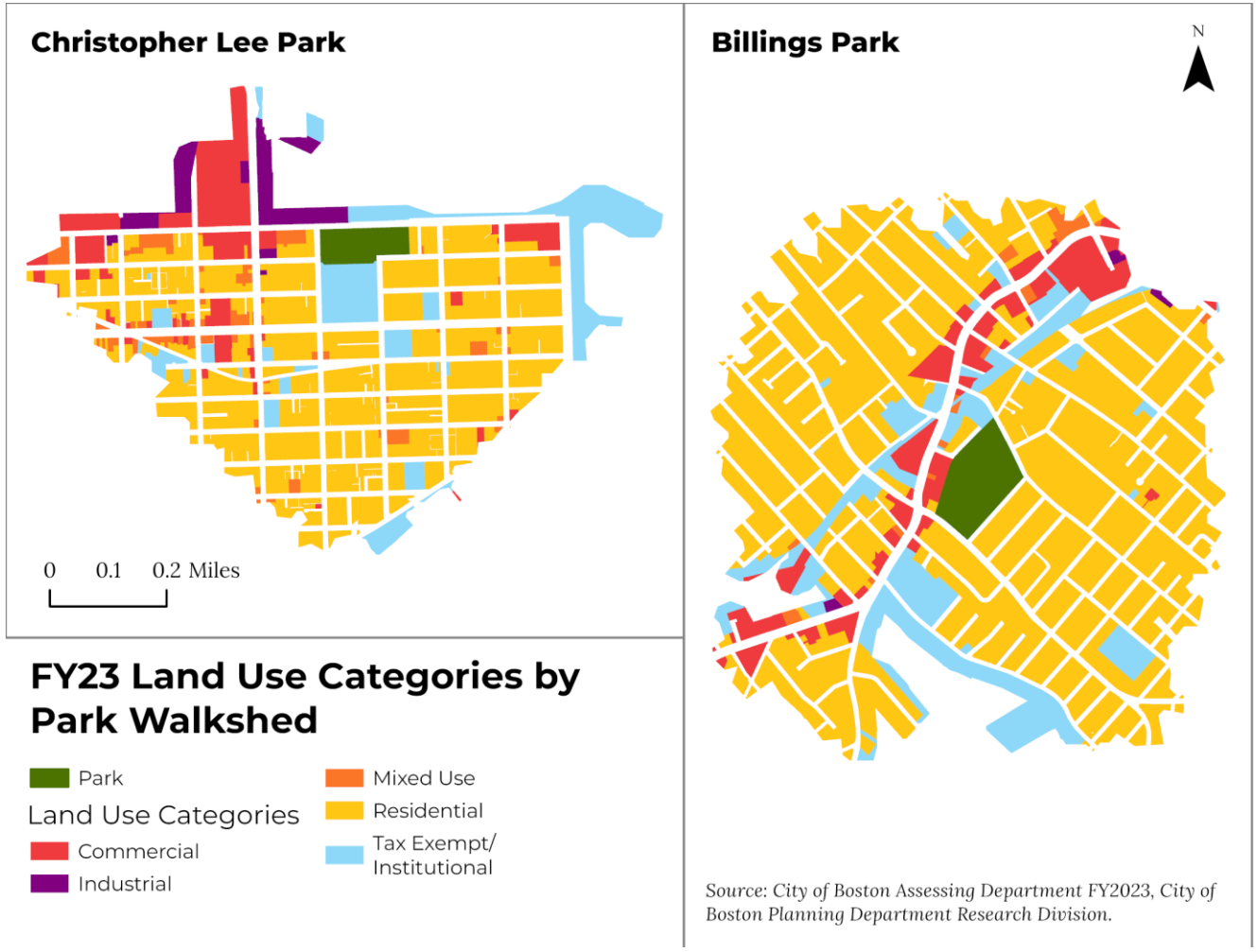
Sidewalks, bike routes, tree canopy

Sources: Lee 2018, Bahriny and Bell 2020, Kongphunphin and Srivanit 2021, Zeng and Liu 2023.

External Context

Surrounding Land Use Mix

FY2023 Land Use Categories by Park Walkshed, 2021



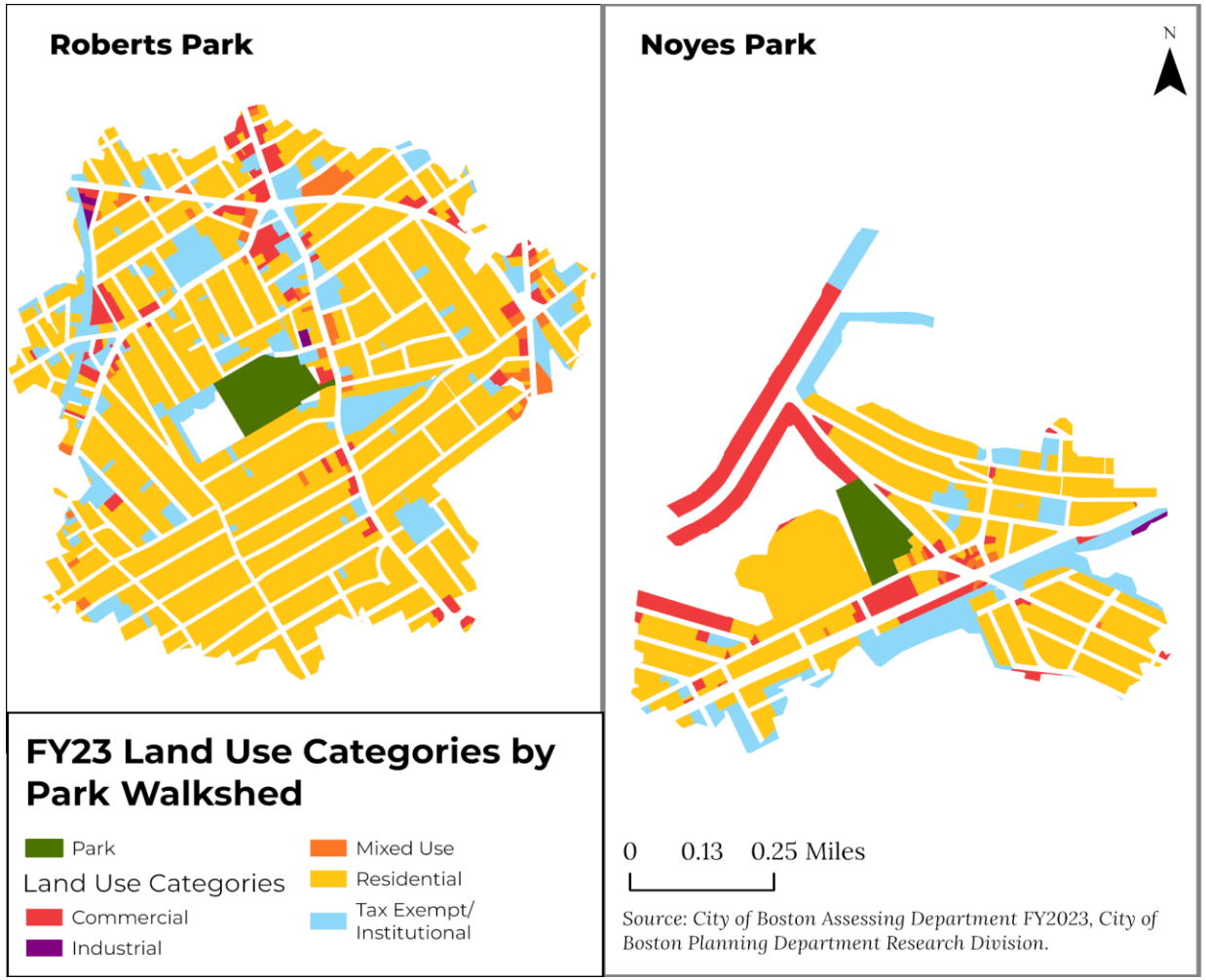
- The two parks exhibit a high degree of **residential** **land use** in their vicinity.
- **Commercial** and **tax-exempt** properties like schools or other parks are near the two parks, with clear commercial corridors.

Question for future research: What insights can land use within walking distance of parks provide for Boston's park system planning or site-specific work?

External Context

Surrounding Land Use Mix

FY2023 Land Use Categories by Park Walkshed, 2021

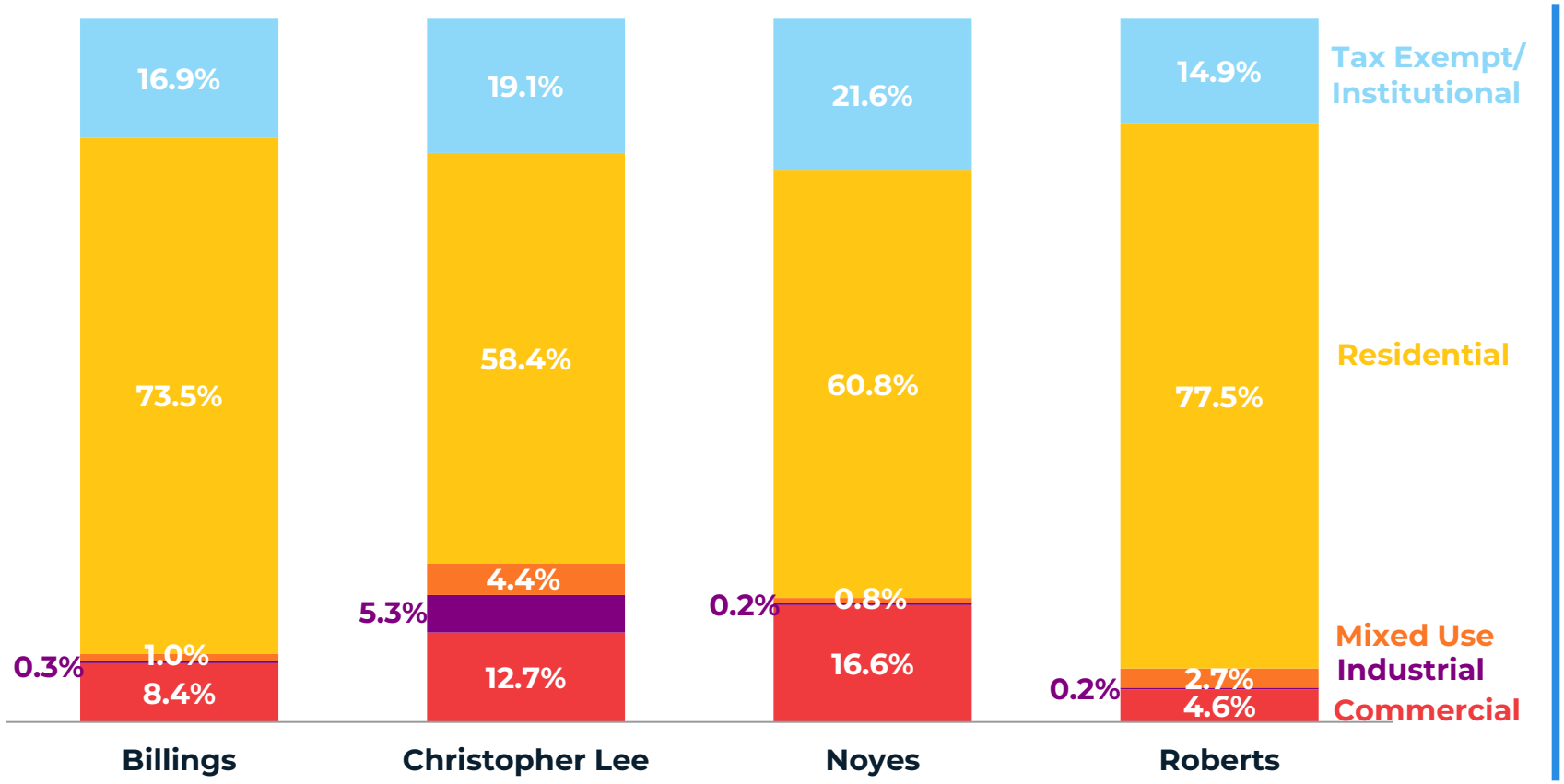


- Roberts and Noyes also exhibit a high degree of **residential** **land use** directly around their vicinity.
- **Noyes**'s walkshed contains a relatively **higher degree** of **tax exempt/institutional** land and **commercial** land than **Roberts**.
- Roberts and Noyes park are near **commercial** street areas.

External Context

Surrounding Land Use Mix

FY2023 Land Use Category by Park Walkshed Parcel Land Area, 2021



Note: Includes park parcels. Source: City of Boston Assessing Department FY2023; City of Boston Planning Department Research Division Analysis.

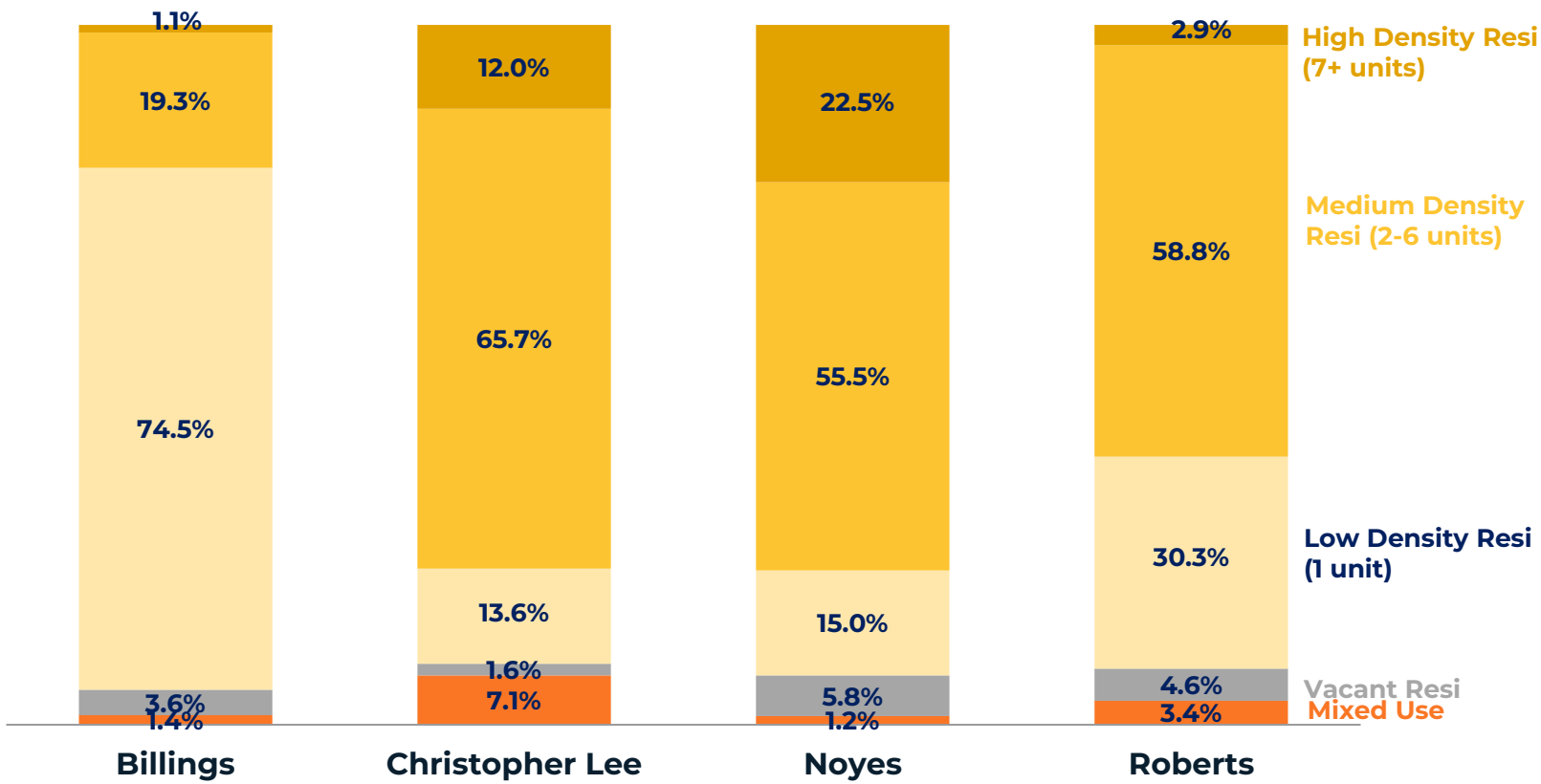
- Christopher Lee and Noyes parks' walksheds contain relatively more **tax exempt** and **commercial** land.
- Christopher Lee has the largest % of **mixed use** and **industrial** land.
- Roberts has the largest % of **residential** land.

Questions for future research:
How might land use mix influence usage patterns?
How does land use mix inform how we think of neighborhood parks in their urban context?

External Context

Surrounding Land Use Mix: Residential

FY2023 Residential Land Use Categories by Park Walkshed Parcel Land Area, 2021



Source: City of Boston Assessing Department FY2023; City of Boston Planning Department Research Division Analysis.

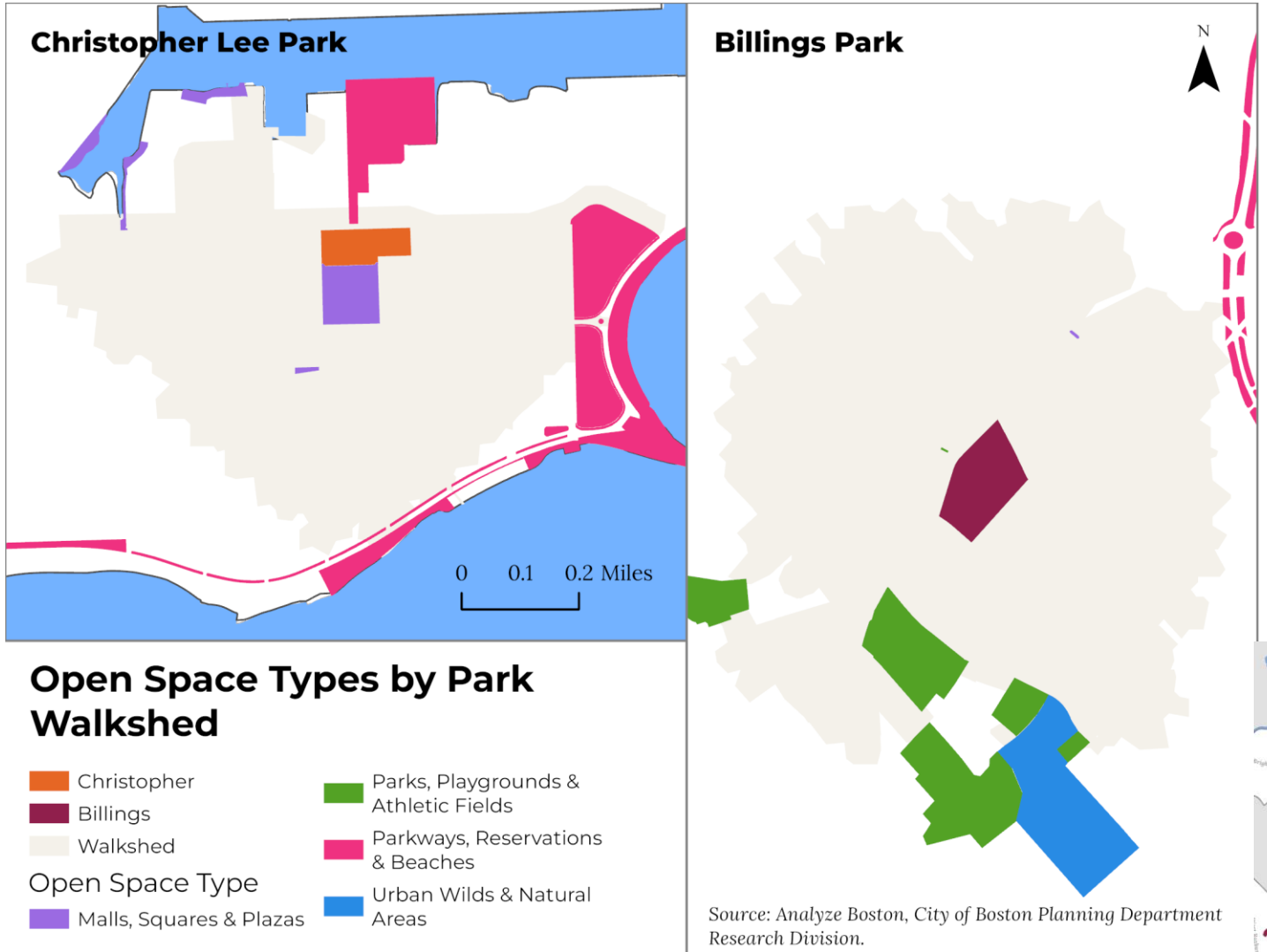
- **Christopher Lee** and **Noyes** park have the most **diverse** surrounding residential land use mix.
- **Billings** park has the **least diverse** surrounding residential land use mix.
- **Noyes** park has the largest proportion of **higher-density** residential

Question for future research: How might residential population density in Boston be related to patterns in park visitorship?

External Context

Surrounding Open Space

Open Space Types by Park Walkshed, 2021



Source: Analyze Boston, City of Boston Planning Department Research Division.

Total Open Space* Intersecting Park Walkshed

	Christopher	Billings
Acres	116.2	103.5
Number	9	7
Types	3	4

*includes Christopher and Billings park respectively

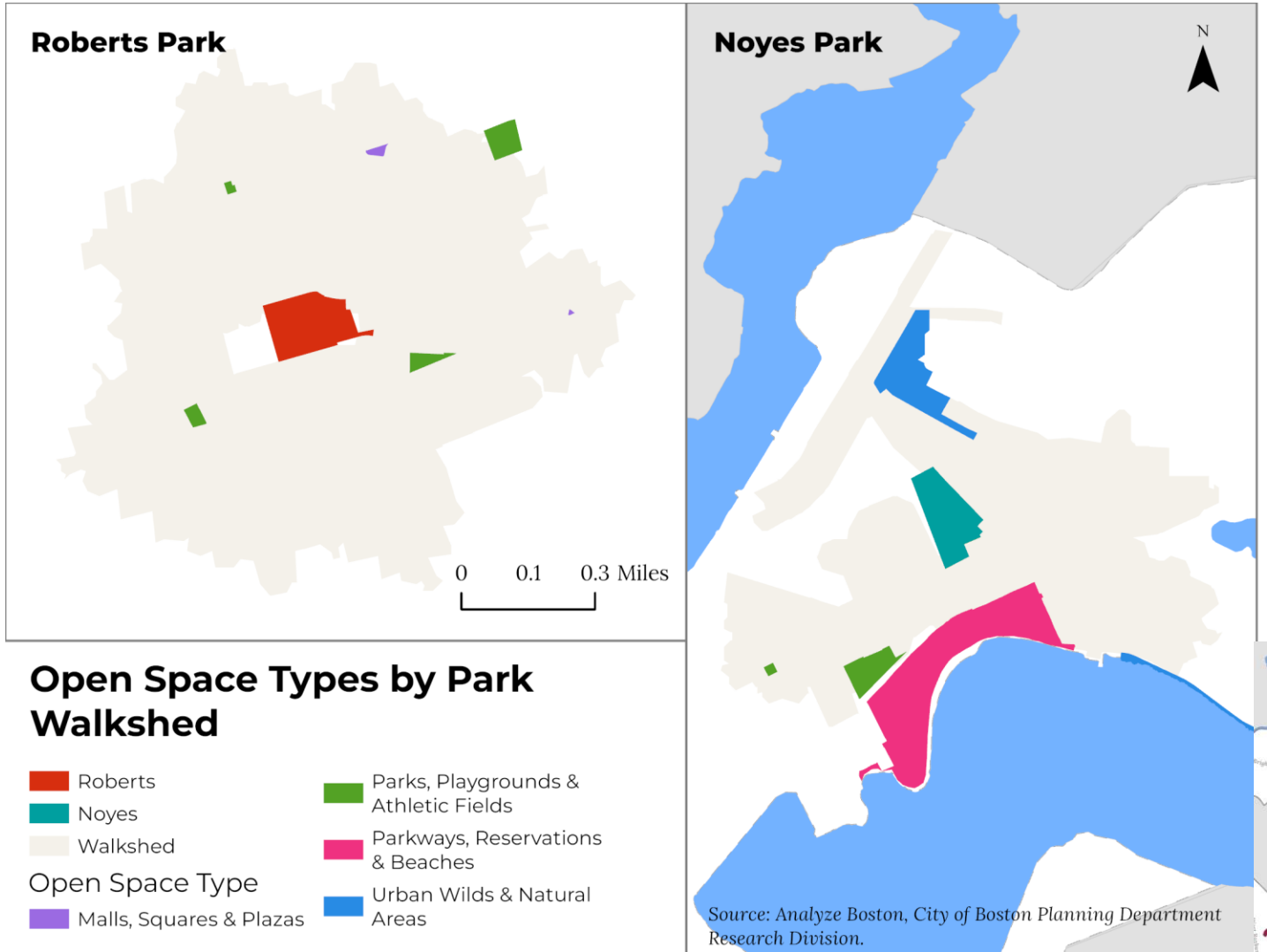
Question for future research:
How might a network of open space within a walkshed impact park visitorship?

City of Boston

External Context

Surrounding Open Space

Open Space Types by Park Walkshed, 2021



Total Open Space* Intersecting Park Walkshed

	Roberts	Noyes
Acres	14.8	43.4
Number	7	6
Types	2	3

*includes Roberts and Noyes park respectively

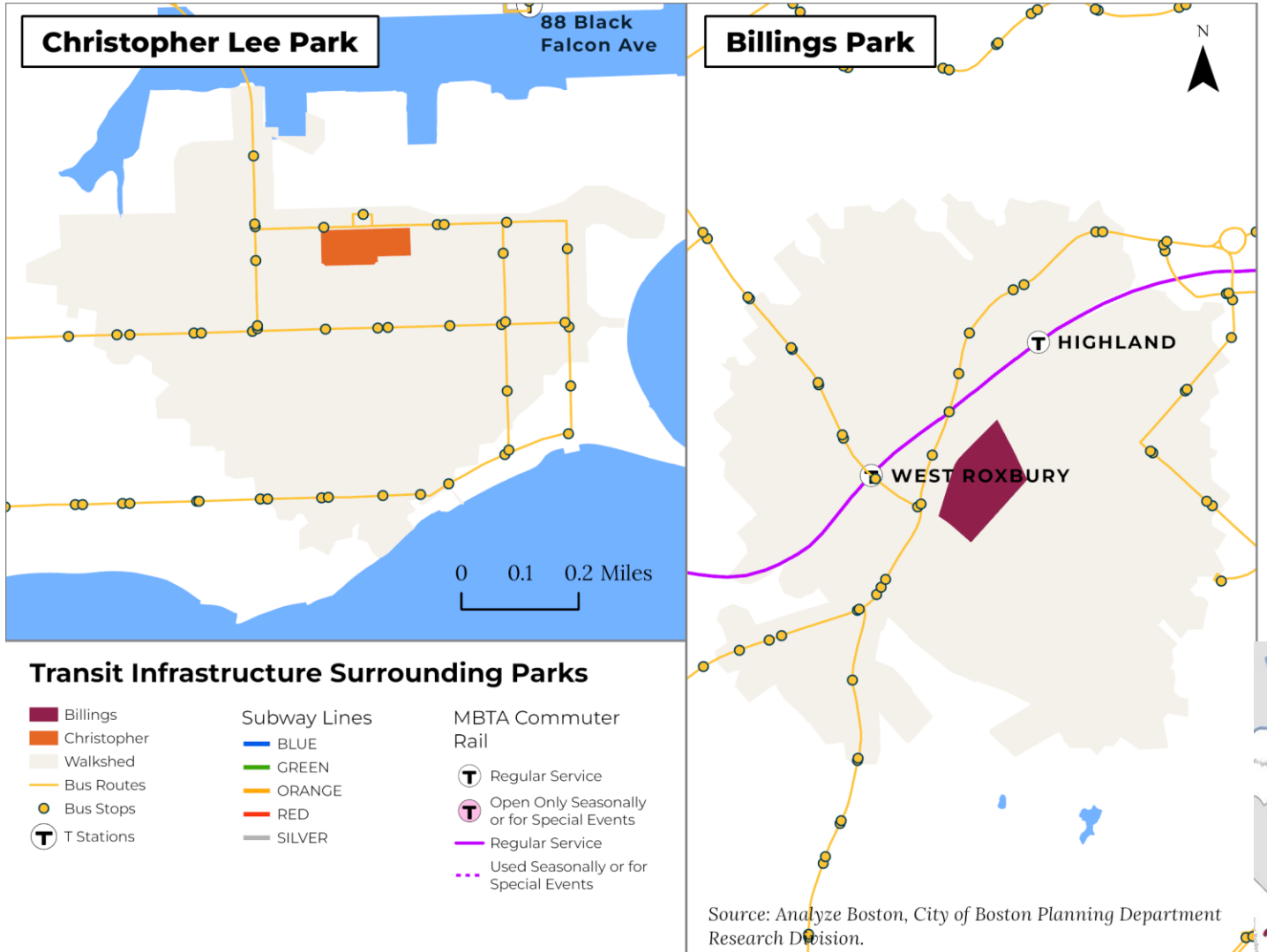
Question for future research:
How might open space access fall along axes of inequality and impact visitorship and demand?

City of Boston

External Context

Transportation Infrastructure

Open Space Types by Park Walkshed, 2021



Source: Analyze Boston, City of Boston Planning Department Research Division.

of Stops in Walkshed

	Christopher	Billings
Bus	36	36
Rapid Transit	0	0
Commuter Rail	0	2

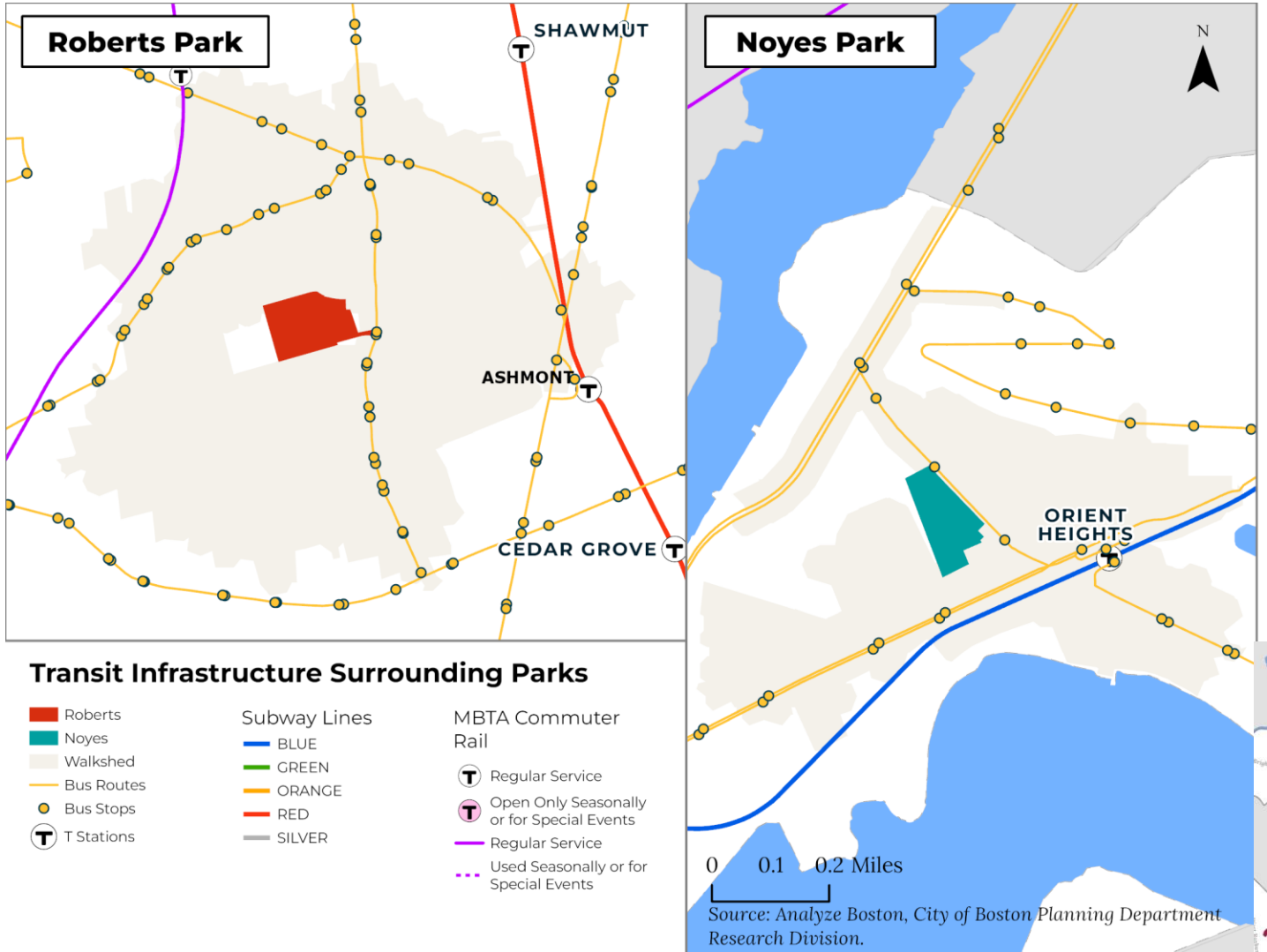
Question for future research:
How does a park's surrounding transit network impact visitorship patterns in Boston?

City of Boston

External Context

Transportation Infrastructure

Open Space Types by Park Walkshed, 2021



of Stops in Walkshed

	Roberts	Noyes
Bus	48	21
Rapid Transit	1	1
Commuter Rail	0	0

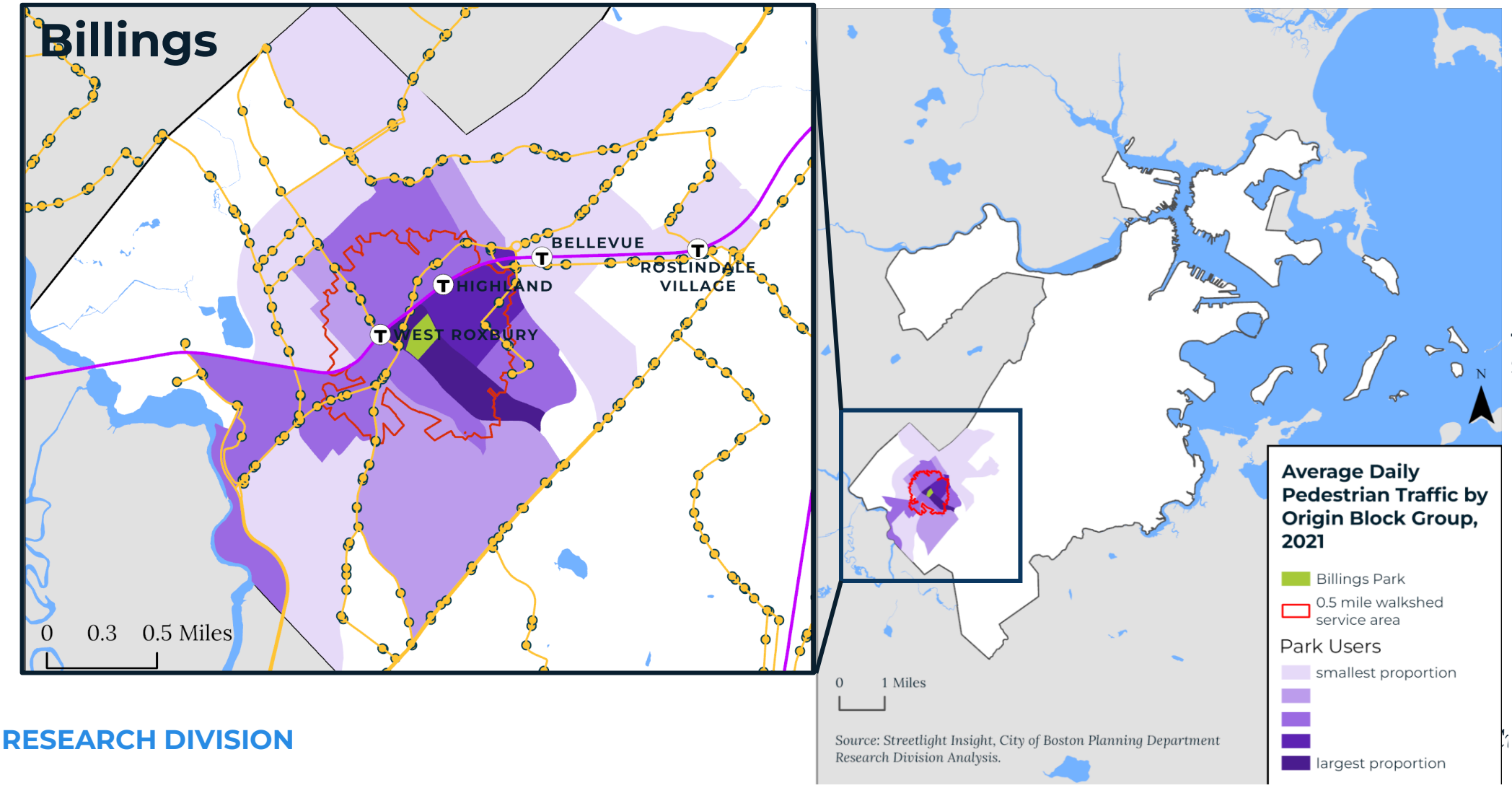
Question for future research:
How does a park's surrounding transit network impact visitorship patterns in Boston?

City of Boston

External Context

Transportation Infrastructure

Map of Park Pedestrian Origins (Where Park Visitors Began Their Walk to the Park) and Available Transportation



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Transportation Infrastructure

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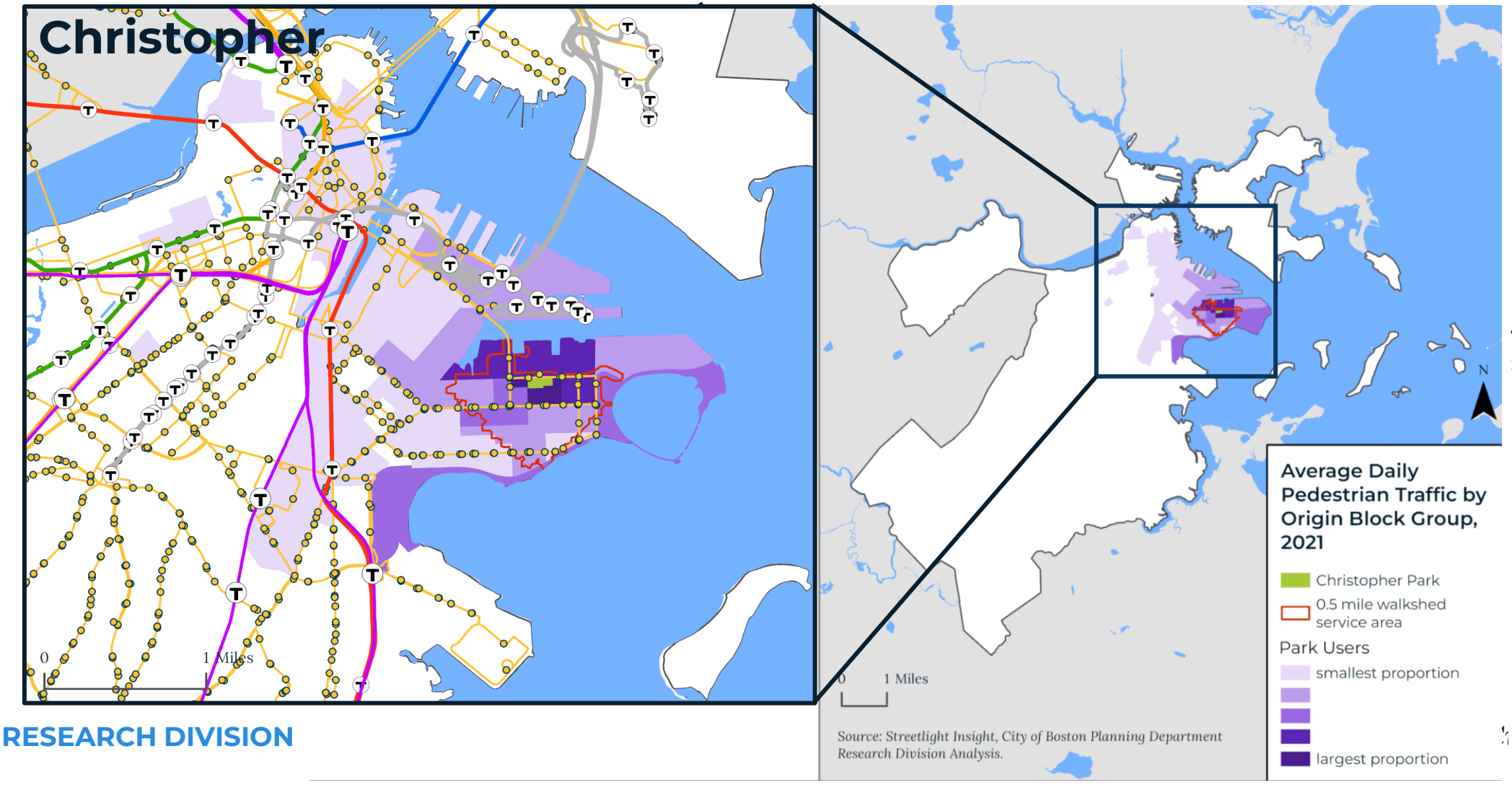
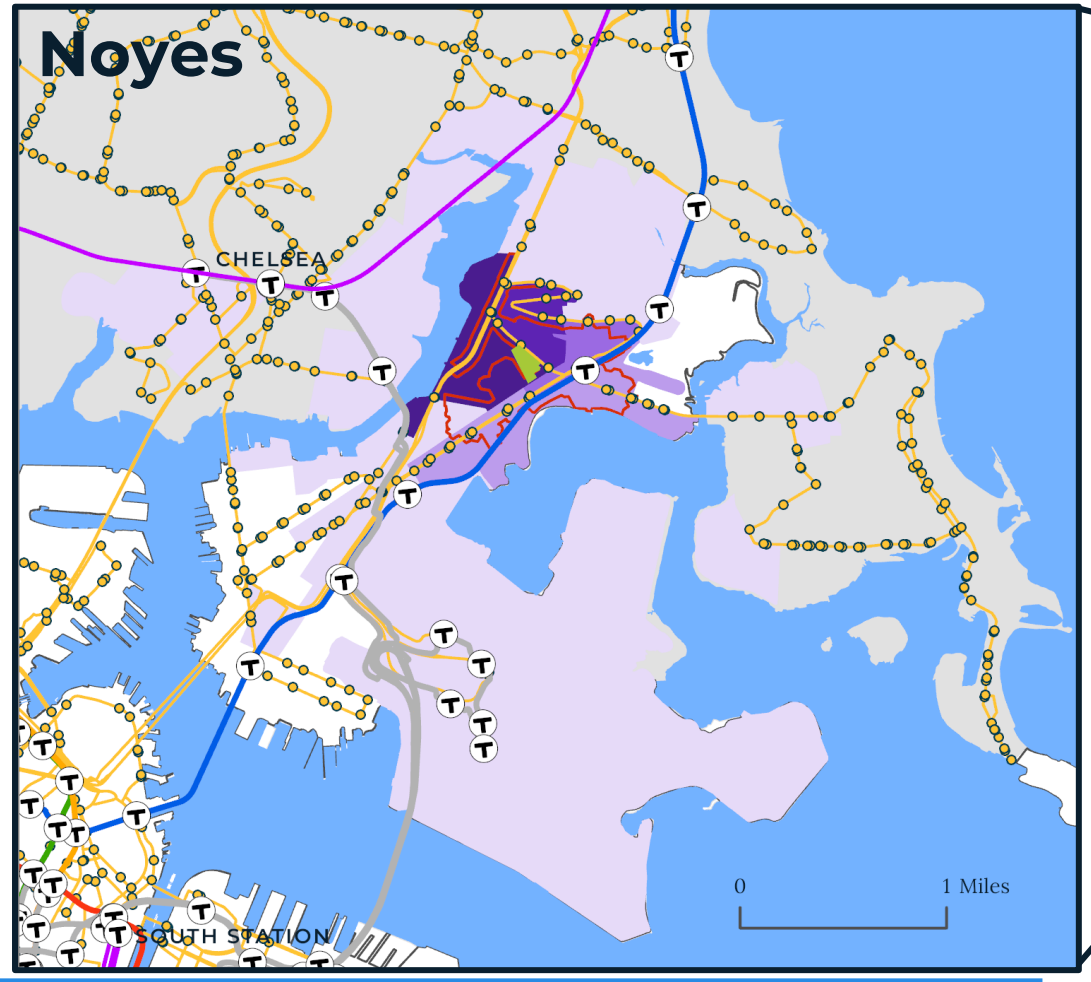


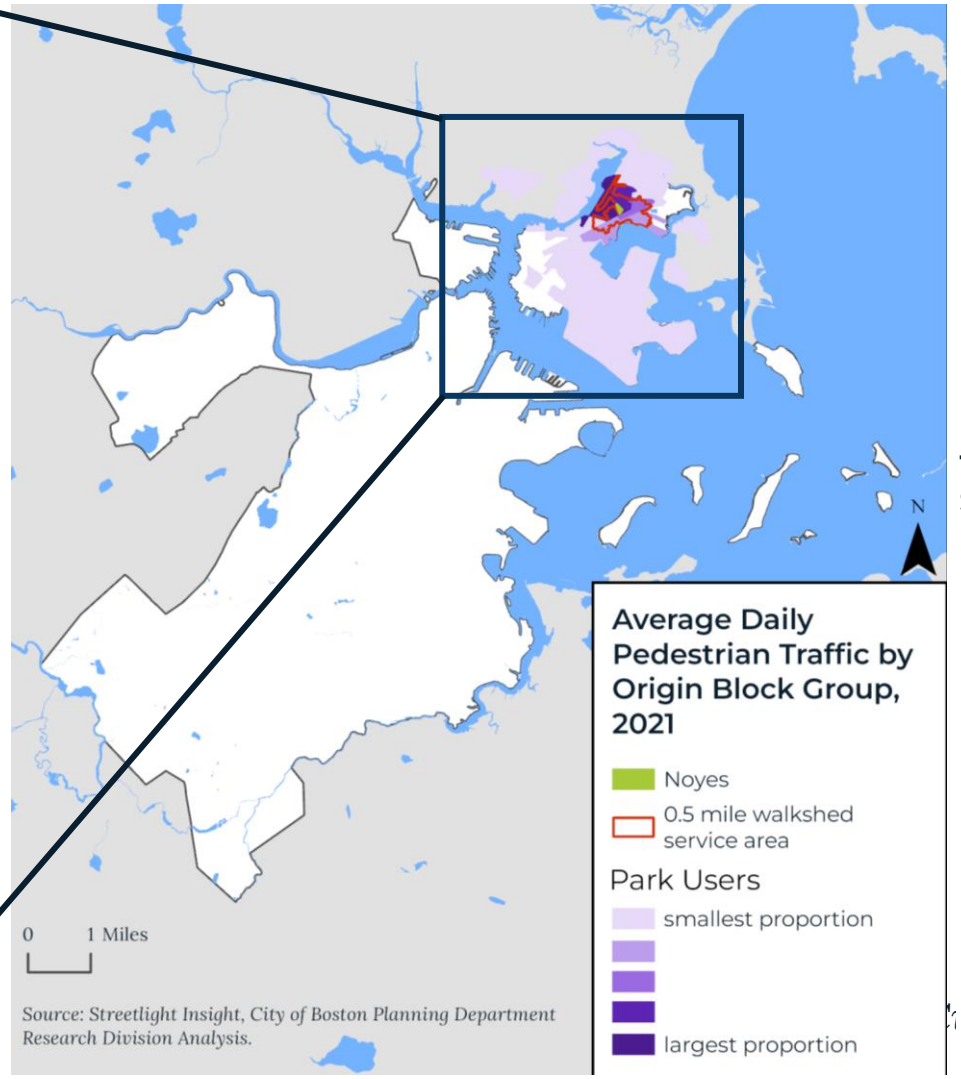
RESEARCH DIVISION

External Context

Transportation Infrastructure

Map of Park Pedestrian Origins (Where Park Visitors Began Their Walk to the Park) and Available Transportation



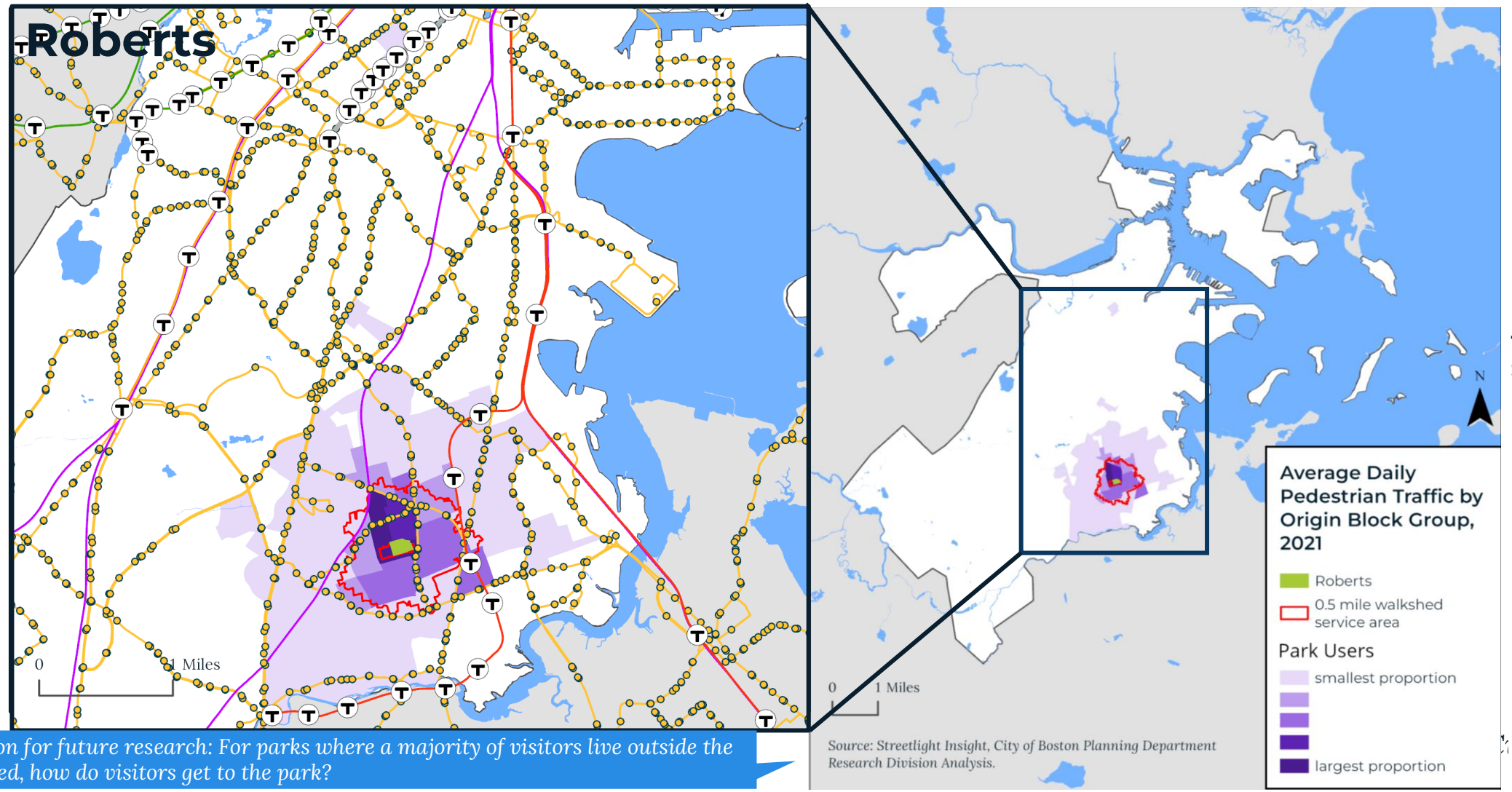


Question for future research: For parks where a majority of visitors live outside the walkshed, how do visitors get to the park?

External Context

Transportation Infrastructure

Map of Park Pedestrian Origins (Where Park Visitors Began Their Walk to the Park) and Available Transportation



Question for future research: For parks where a majority of visitors live outside the walkshed, how do visitors get to the park?

PARKS PROJECT PT.2

1. INTRODUCTION
2. CHARACTERIZING PARK USAGE
   Billings, Christopher, Noyes, Roberts
3. CHARACTERIZING PARK USERS
   Billings, Christopher, Noyes, Roberts
4. CHARACTERIZING PARK CONTEXT
5. CONCLUSION

Characterizing Park Usage

What we've learned about how these 4 Boston parks are used

1 **Billings**	• Around 3 in 10 park users pass through the park • The proportion of passers has increased over time • In 2021 average traffic down from 2019
2 **Christopher Lee**	• Around 6 in 10 park users pass through the park • The proportion of passers has decreased over time • In 2021 average traffic up from 2019
3 **Noyes**	• Around 5 in 10 park users pass through the park • The proportion of passers has decreased over time • In 2021 average traffic down from 2019
4 **Roberts**	• Around 5 in 10 park users pass through the park • The proportion of passers has increased over time • In 2021 average traffic down from 2019

Characterizing Park Users

What we've learned about who uses these 4 Boston parks

1 Billings

- 57% of users live within the 0.5 mile walkshed service area.
- Users are most likely to be aged 0-17, White, make 150k+ a year, not have children, take a car truck or van to work, have access to 1 vehicle, and own their own home.

2 Christopher Lee

- 60% of users live within the 0.5 mile walkshed service area.
- Users are most likely to be aged 25-34, White, make 150k+ a year, not have children, take a car truck or van to work, have access to 1 vehicle, and own their own home.

3 Noyes

- 34% of users live within the 0.5 mile walkshed service area.
- Users are most likely to be aged 0-17, White, make 10-30k a year, not have children, take a car truck or van to work, have access to 1 vehicle, and rent.

4 Roberts

- 31% of users live within the 0.5 mile walkshed service area.
- Users are most likely to be aged 0-17, Black or African American, make 10-30k a year, have children, take a car truck or van to work, have access to 1 vehicle, and rent.

Characterizing Walkshed Residents

What we've learned about who lives near these 4 Boston parks

1 Billings

- Walkshed residents were less likely than park users to be foreign born, Hispanic, to have children, to rent, to take public transit or walk to work, to have access to 0 vehicles, and have a disability.
- Walkshed residents were more likely to be White, Multiracial or Asian/PI, be aged 25-44 or 55-64, have a high annual household income, and speak English less than very well.

2 Christopher Lee

- Walkshed residents were less likely than park users to be foreign born or Hispanic, to rent, to take a car, truck, or van to work, to have access to 0 or 3+ vehicles, to have children, and have a disability.
- Walkshed residents were more likely to be White and aged 25-44, have a high annual household income, speak English less than very well, take public transit to work or WFH, and have access to 1-2 vehicles.

3 Noyes

- Walkshed residents were less likely than park users to have a disability, to have children, and take public transit or walk to work.
- Walkshed residents were more likely to be White, Multiracial, foreign-born, Hispanic, or aged 25-34, have a high household income, speak English less than very well, take a car, truck or van to work or WFH, have access to 0, 1, or 3+ vehicles, to rent.

4 Roberts

- Walkshed residents were less likely than park users to be Hispanic, renters, speak English less than very well, to have children, or take a car truck, or van to work.
- Walkshed residents were more likely to be Black, Asian, or foreign-born, have a high household income, take public transit or work from home, have access to 2 or 3+ vehicles, and have a disability.

Questions for Future Research

All Boston Parks

How can we expand this analysis of visitorship to other Boston parks?

In-person Data Validation

How does the data compare to real observed park usage? How does it compare to other datasets?

Statistical Analysis

Given patterns we have identified through descriptive and cartographic analysis, further statistical analysis to understand relationships and co-relating factors impacting visitorship and evaluating walkshed representativeness.

Level of Service Analysis

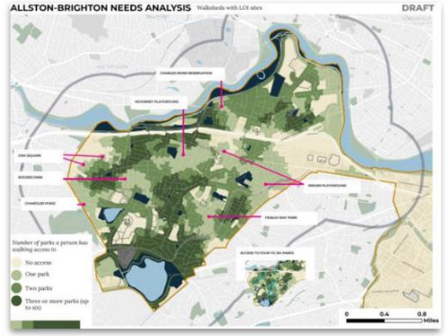
Strategically assess facility and programmatic needs across the city to inform capital improvement priorities using data and metrics, community input, and planning.

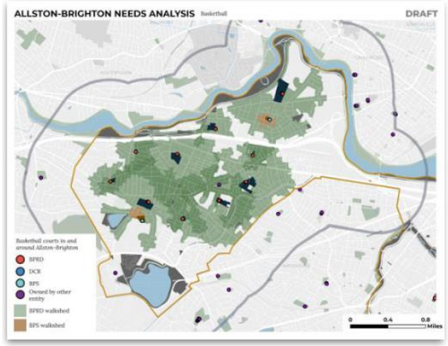
Research is tailored to assist the Parks Department in allocating resources and developing or clarifying policies to meet the needs of residents.

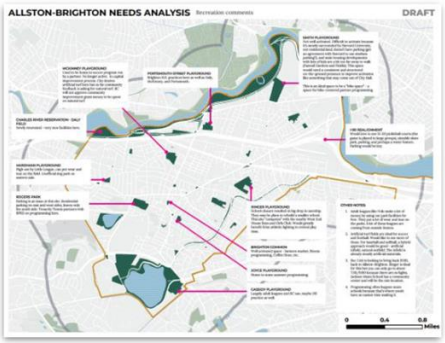
This analysis may recommend approaches to: partnerships, permitting, investment, programming, maintenance, design, and Article 80 development review.

Level of Service Analysis

- *2023-2029 OSRP research and action plan*
- *Spaces for You research*
- *Park visitorship analysis*
- *Case study review*
- *Preliminary geospatial analysis*
- *Staff interviews*
- *Facility briefs*







Planning and Research at Boston Parks and Recreation

Planning
near-term and long-term studies

Acquisition
expanding the park system through land acquisition and protection

Data Science
developing critical data tools and metrics

https://www.boston.gov/departments/parks-and-recreation/planning-and-research-boston-parks

Thank you ☺

APPENDIX: ABOUT THE DATA

Streetlight

- Used their estimated pedestrian traffic data: modeled data estimate of the average pedestrian traffic in the zone for a typical day/time combination in the time series.
- **Metric: Streetlight Pedestrian Volume**
  - = the number of pedestrian trips that interact with your zone of analysis.
  - Pedestrian trips identified in location data sources (including cellphone mobility data) and differentiated from trips using other modes.
- **Streetlight** calculates the **Pedestrian Volume estimate** by:
  - Computing a population factor for each trip and using these factors to weight the pedestrian trip sample by local population.
  - Using the vehicle penetration rate near the target zone to estimate the pedestrian penetration rate.
  - Reducing the Pedestrian Volume estimate by a constant factor to index more closely to permanent pedestrian counters.

U.S. Census Bureau

- Used the U.S. Census Bureau API to access demographic data for the relevant block groups (identified via Streetlight for park users and via BPRD-provided walkshed service area shapefile for walkshed comparison) from the 5-year American Community Survey 2017-2021 to reflect the most recent available year of Streetlight data (2021).

Sources: Streetlight Insight Whitepapers.