



# ENERGY TRANSITIONS INITIATIVE

U.S. Department of Energy

## Partnership Project

### ETIPP Kauai, Task 2: Kauai Transportation Preference Survey Analysis

Yanbo Ge<sup>a</sup>, Cemal Akcicek<sup>a</sup>, Venu  
Garikapati<sup>a</sup>, Chun Ho Chow<sup>b</sup>,  
Natalie Popovich<sup>b</sup>

<sup>a</sup> National Renewable National Laboratory

<sup>b</sup> Lawrence Berkeley National Laboratory



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# ETIPP Kauai: Transportation Preference Survey Summary

Kauai, also called the garden island, is known for its emerald valleys, sharp mountain spires, and jagged cliffs. The unique terrains and the rural characteristics are the things that set it apart from other Hawaiian islands. However, like many other areas developed in the last half century, Kauai's transportation system has been designed around moving cars as opposed to moving people. Its transportation system and tourism-centered economy are overly dependent on automobiles and petroleum fuels, which creates key resilience challenges for this remote island community. The long-term energy resilience goal of the island is to eliminate fossil fuel use in ground transportation sector by 2045.

Through the Energy Transitions Initiative Partnership Project (ETIPP) with Kauai, we aim to provide recommendations on how to build a multi-modal sustainable mobility system on the island. To achieve this goal, we conducted surveys to understand the transportation preferences of both residents and visitors on the island. The questions answered by these survey analysis results include but are not limited to:

- How are residents and visitors moving around currently?
- How often do visitors rent cars on the island?
- How much do visitors use their rental cars during the rental duration?
- How do residents and visitors feel about micromobility services?

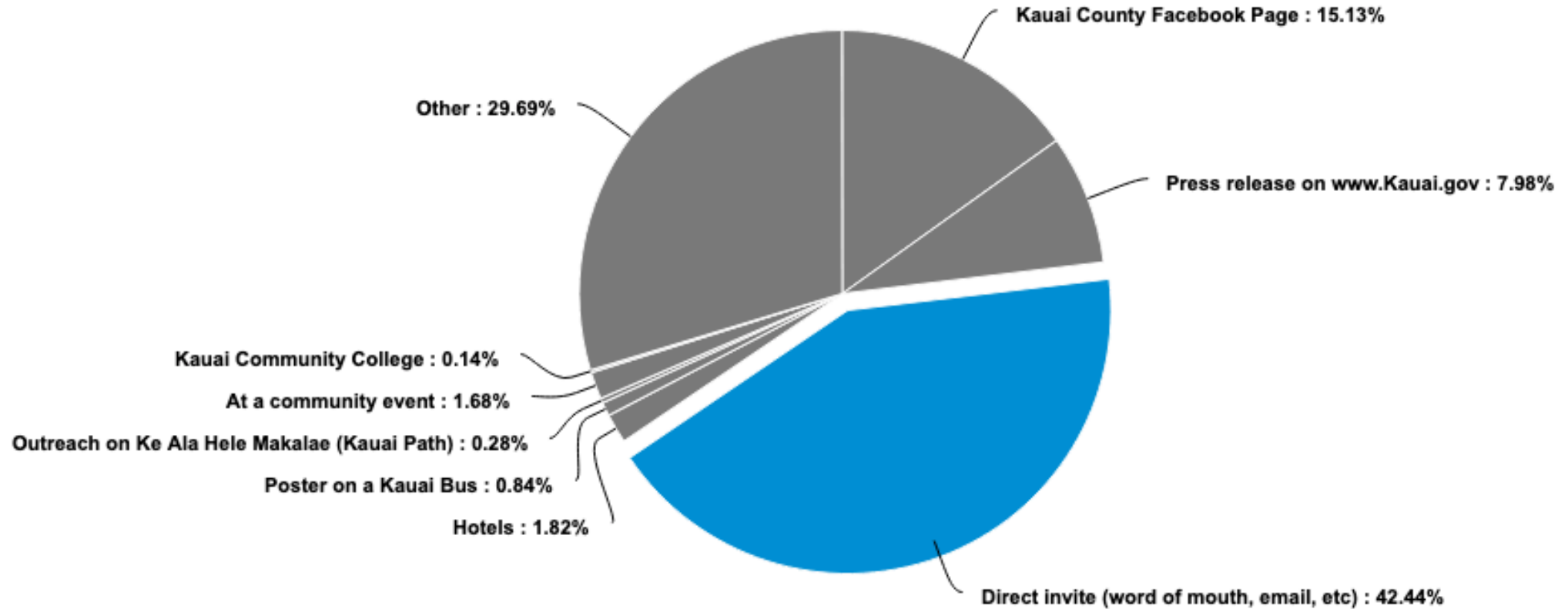
# ETIPP Kauai: Transportation Preference Survey Summary

Kauai County conducted the web-based survey among residents and visitors between July and October 2022. The survey was programmed in Questionpro by the research team. Survey respondents were recruited through direct invite via email list, county website and Facebook page, etc. 1,396 survey responses were collected with 1,033 complete responses, among which 764 were residents of Kauai, and 269 were visitors on the island.

Survey questions were customized to cater to the distinct travel needs of residents and visitors. Residents were inquired regarding their mode choice decisions for commute, leisure and shopping activities, and whether they would consider using alternative modes instead of driving when the circumstances change. Visitors were asked whether they would consider transportation alternatives to rental cars, if such options were available.

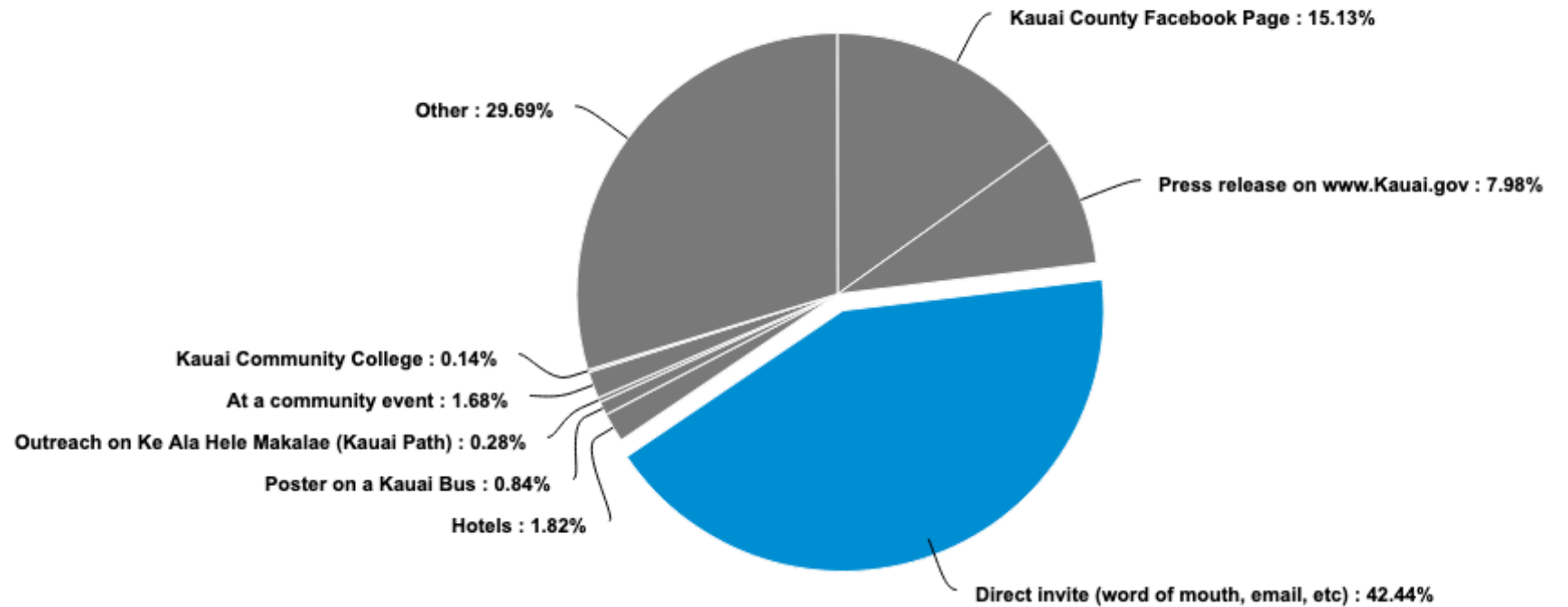
# Transportation Preference Survey Results

# Recruitment Channels



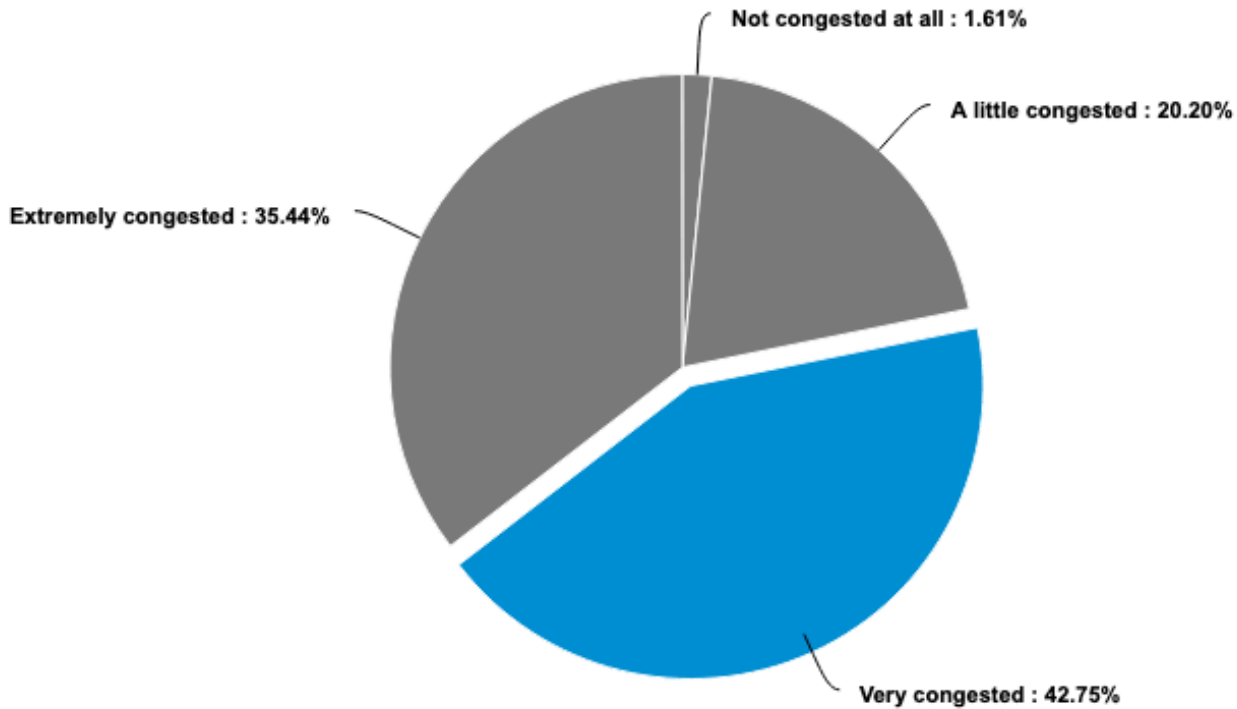
# Respondents

- 1,396 respondents
- 1,034 completed (74% completion rate)
  - 269 visitors (83% completion rate)
  - 764 residents (75%).

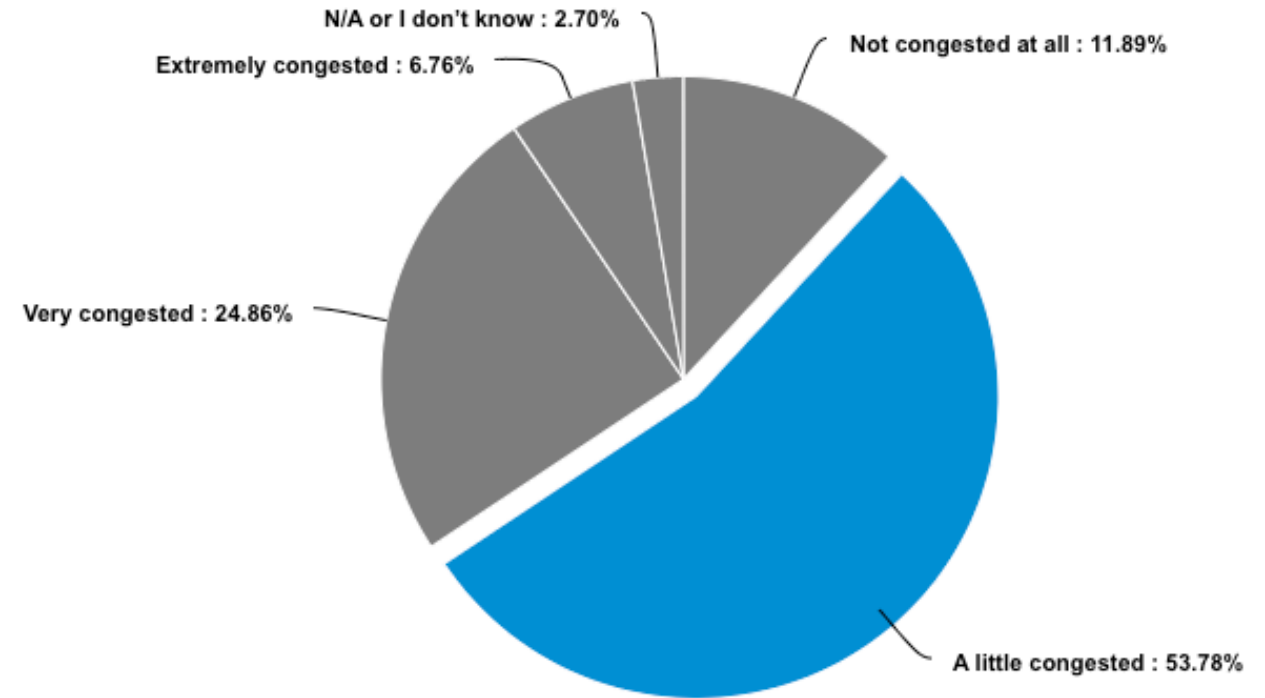


# Perceptions on Congestion

## Residents



## Visitors

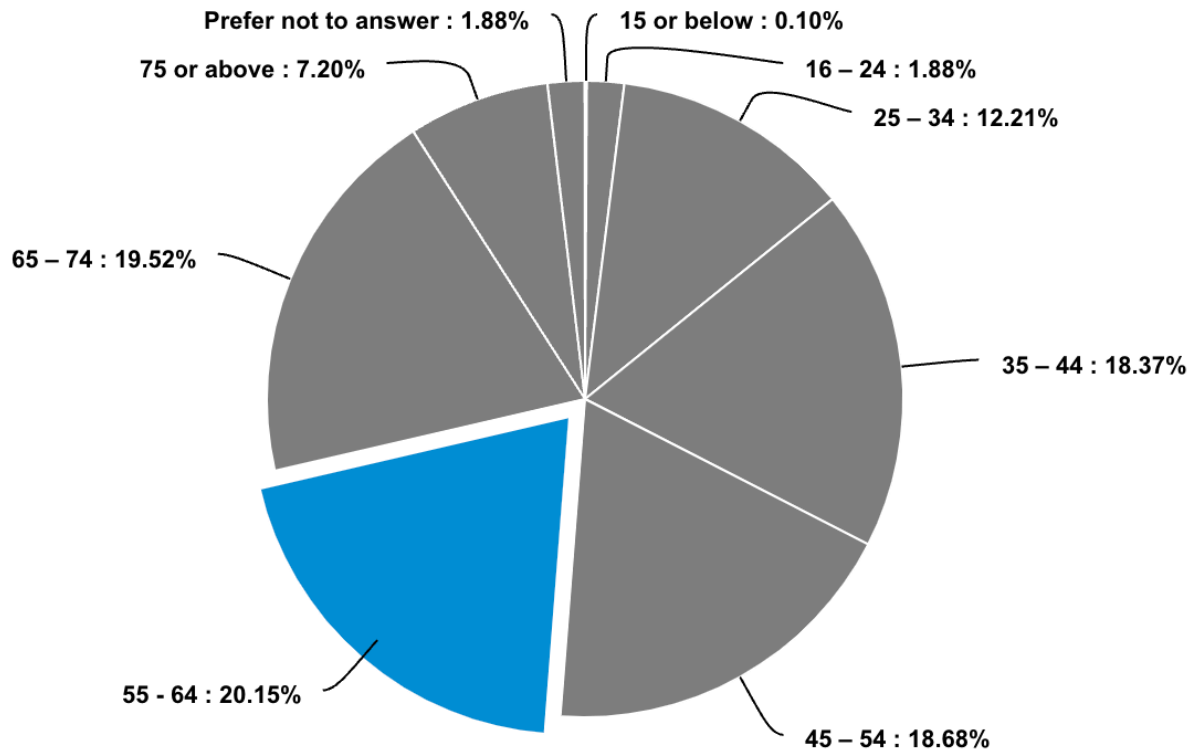




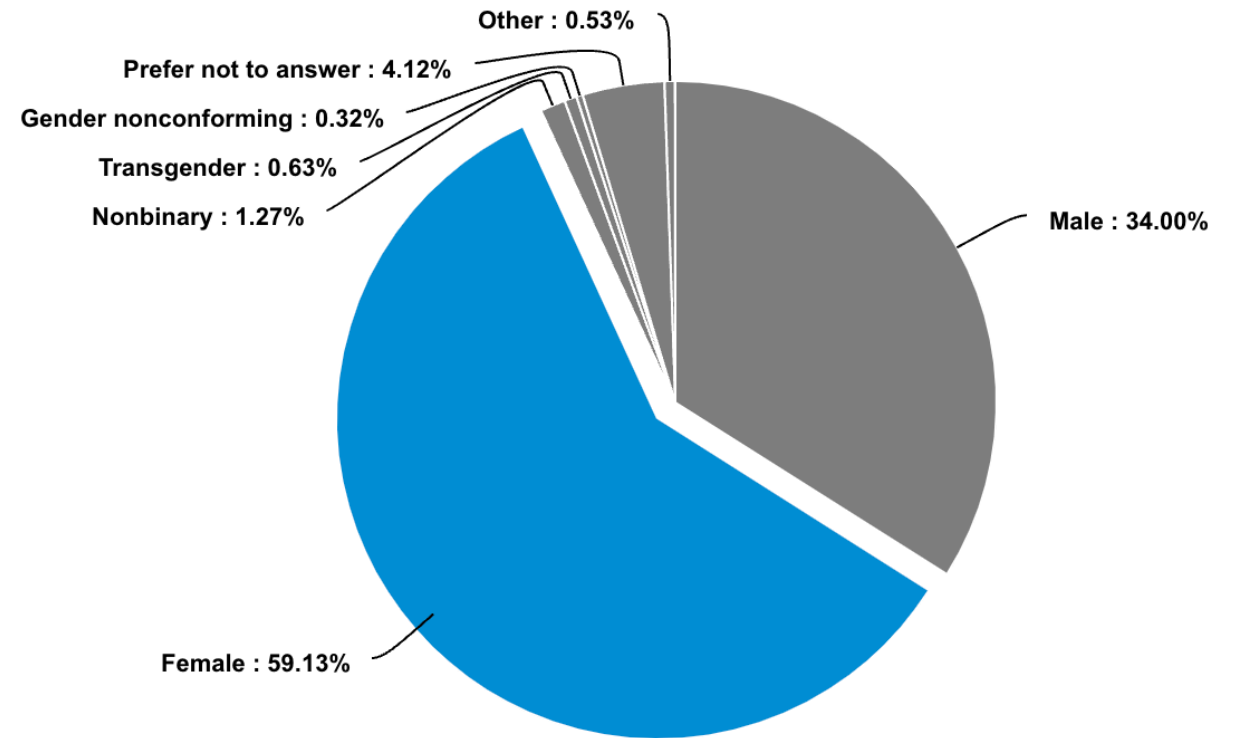
# **Transportation Preference Survey Results: Residents**

# Residents: Age and Gender

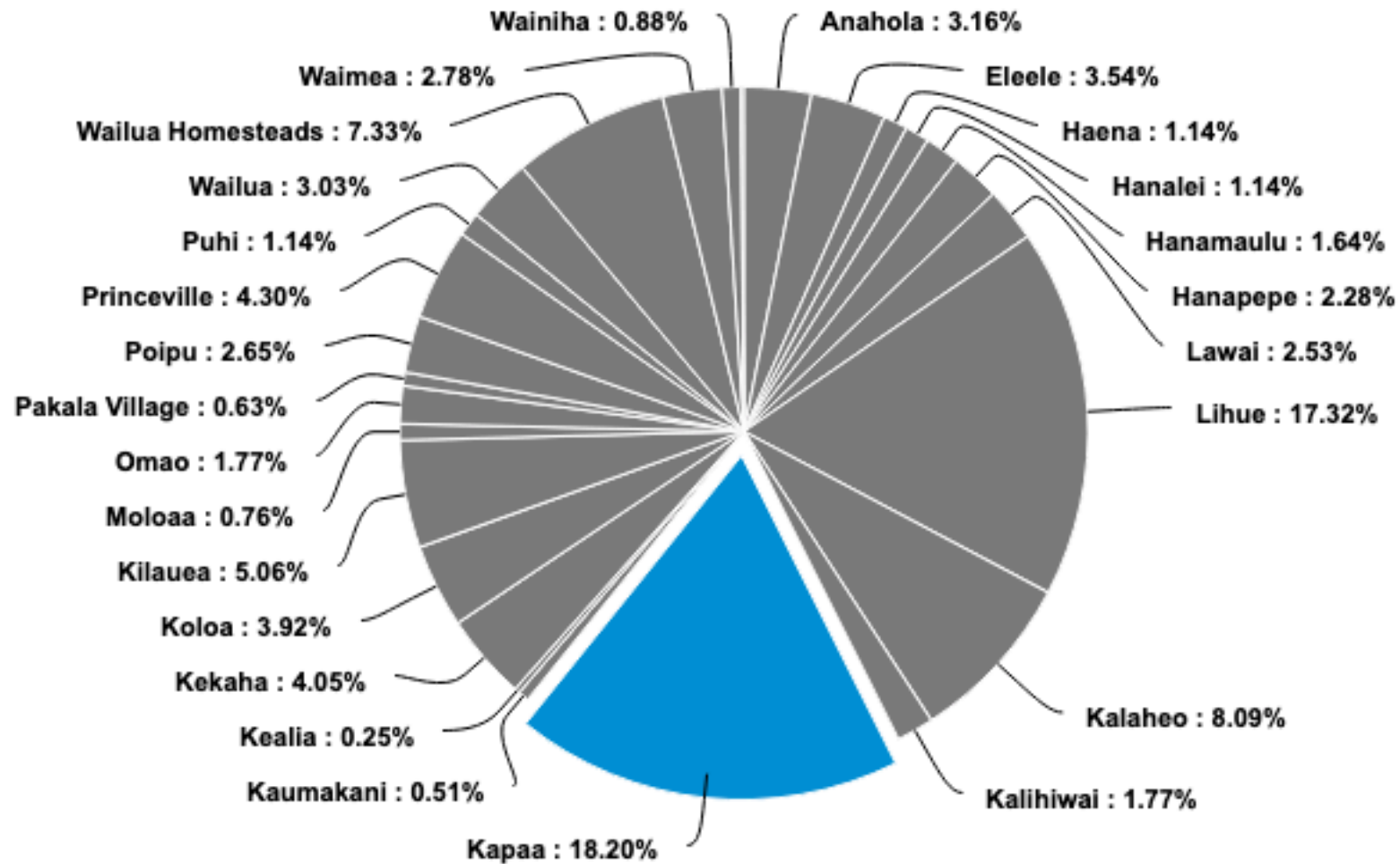
## Age



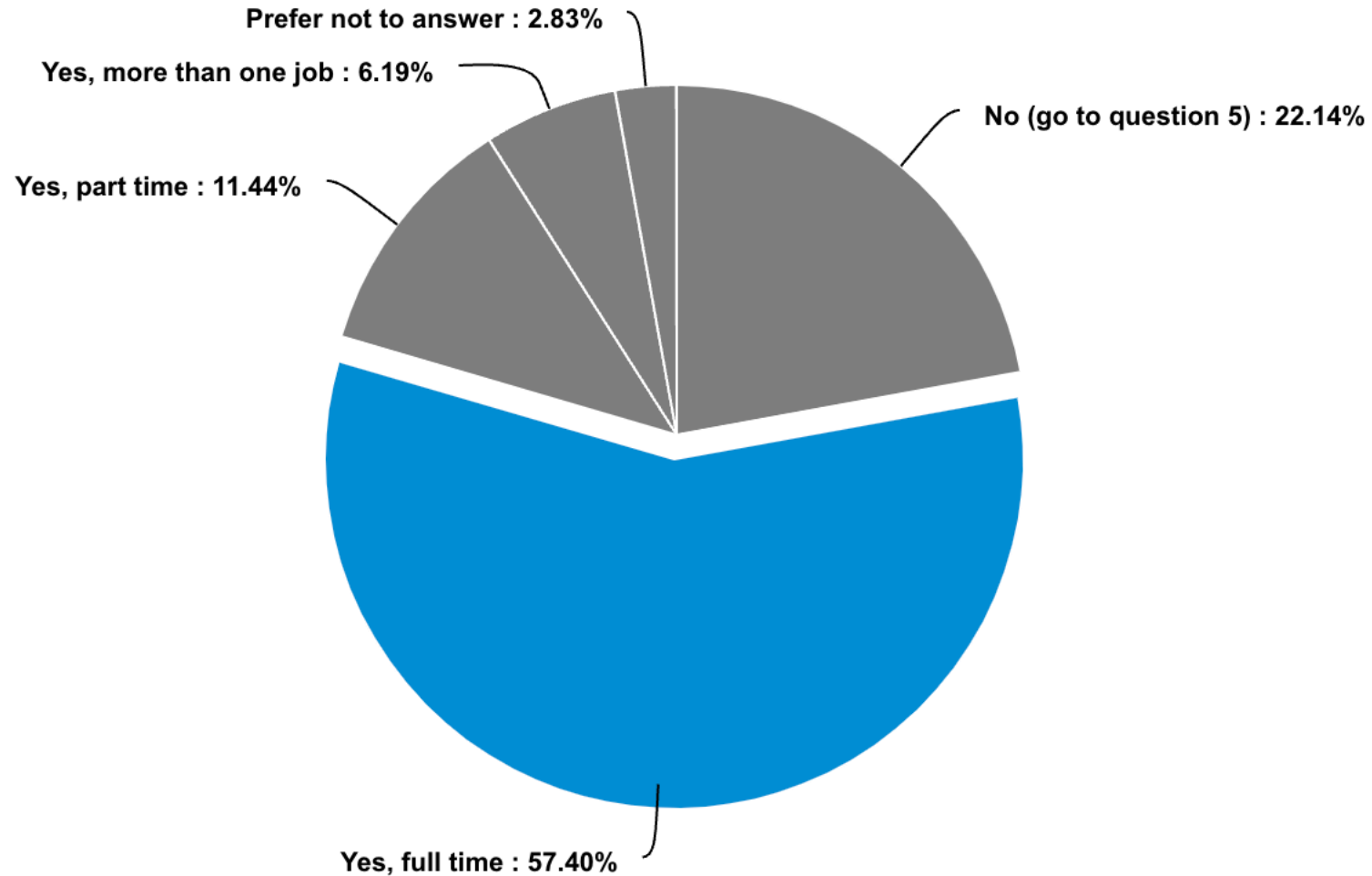
## Gender



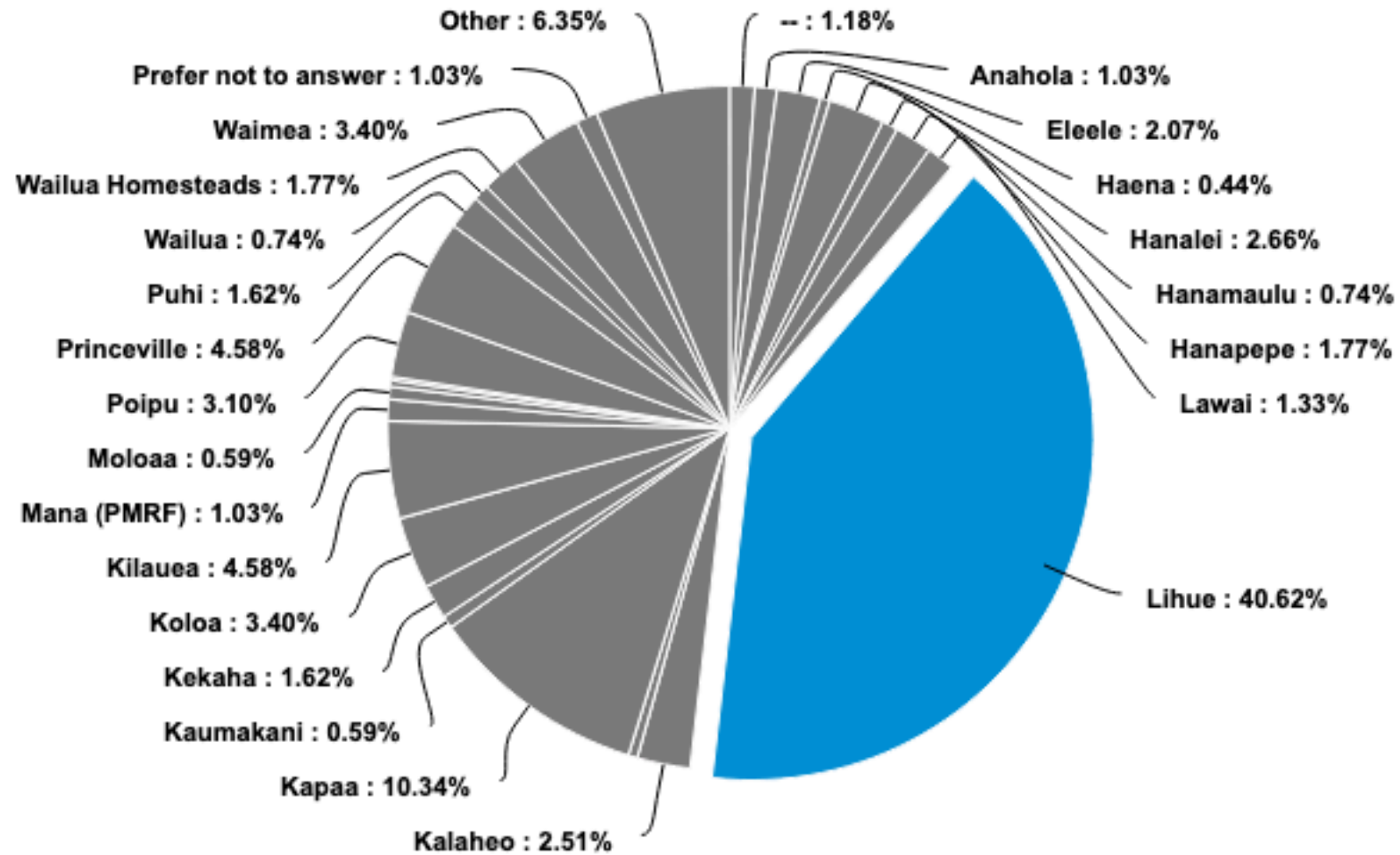
# Residents: Home Location



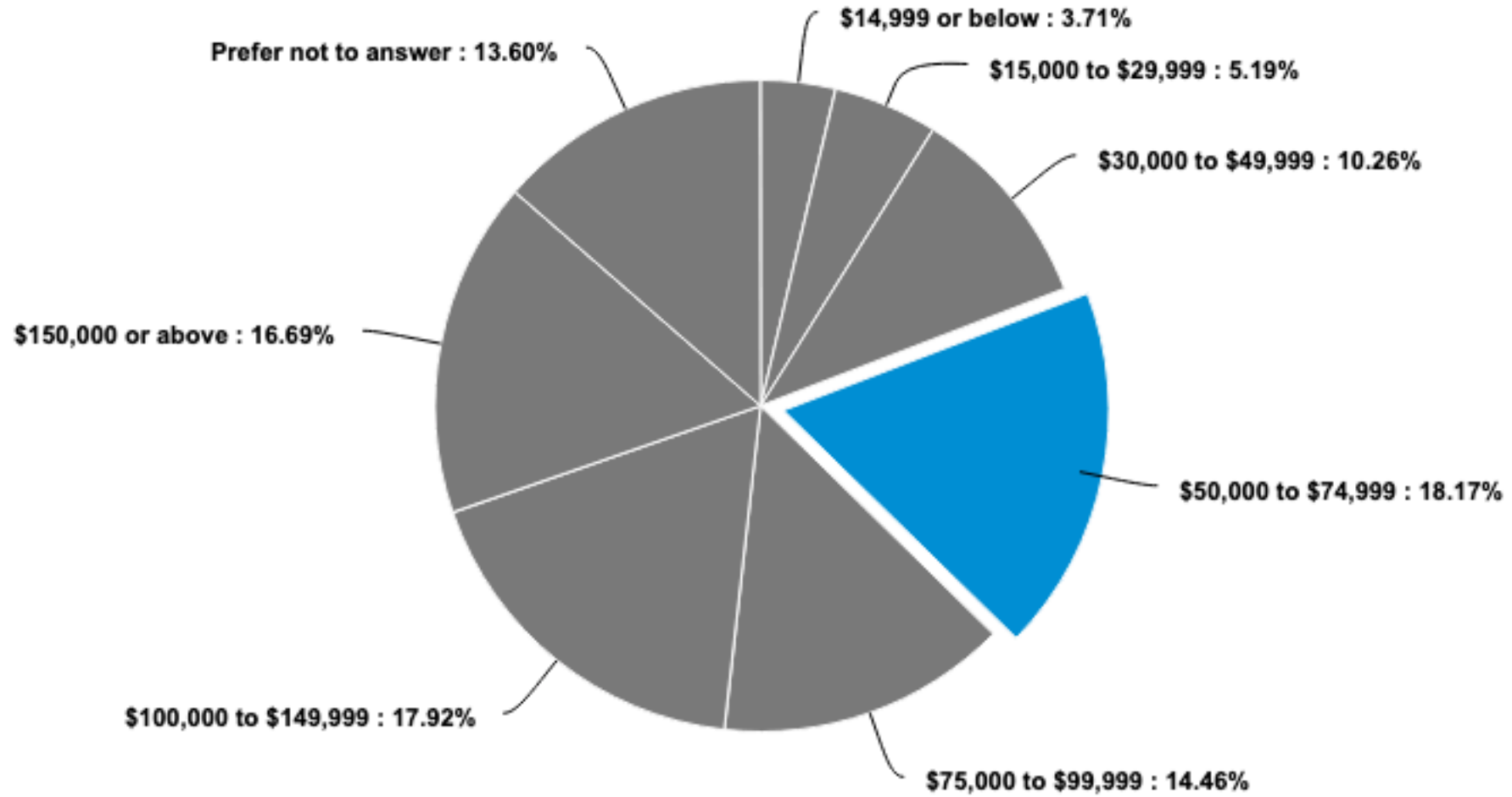
# Residents: Are You Currently Employed?



# Residents: Work Location

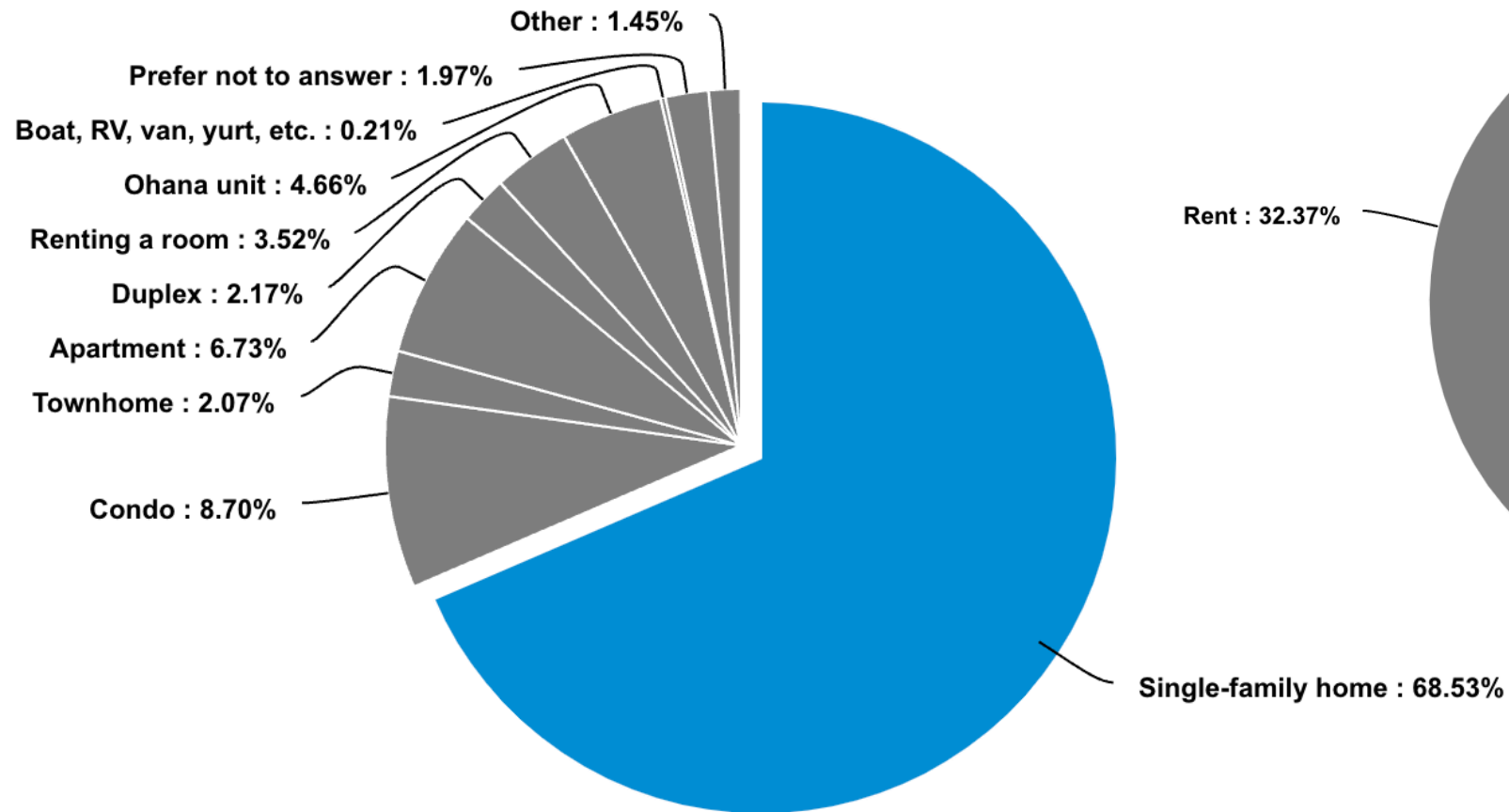


# Residents: Income

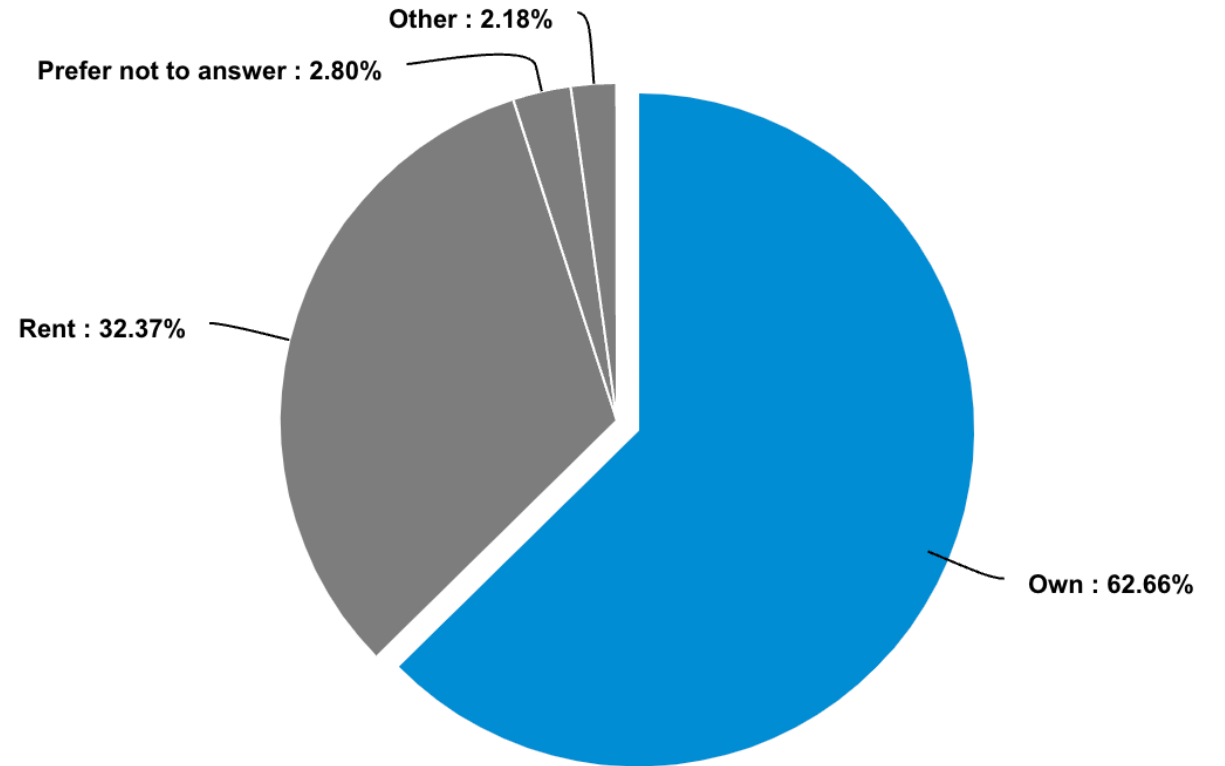


# Residents: Housing Type and Tenure

## Housing Type

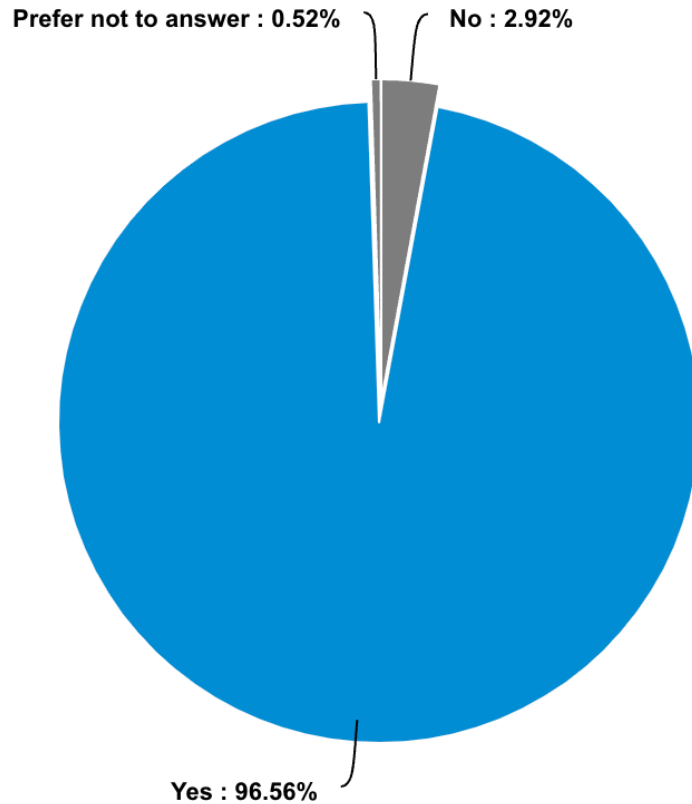


## Housing Tenure

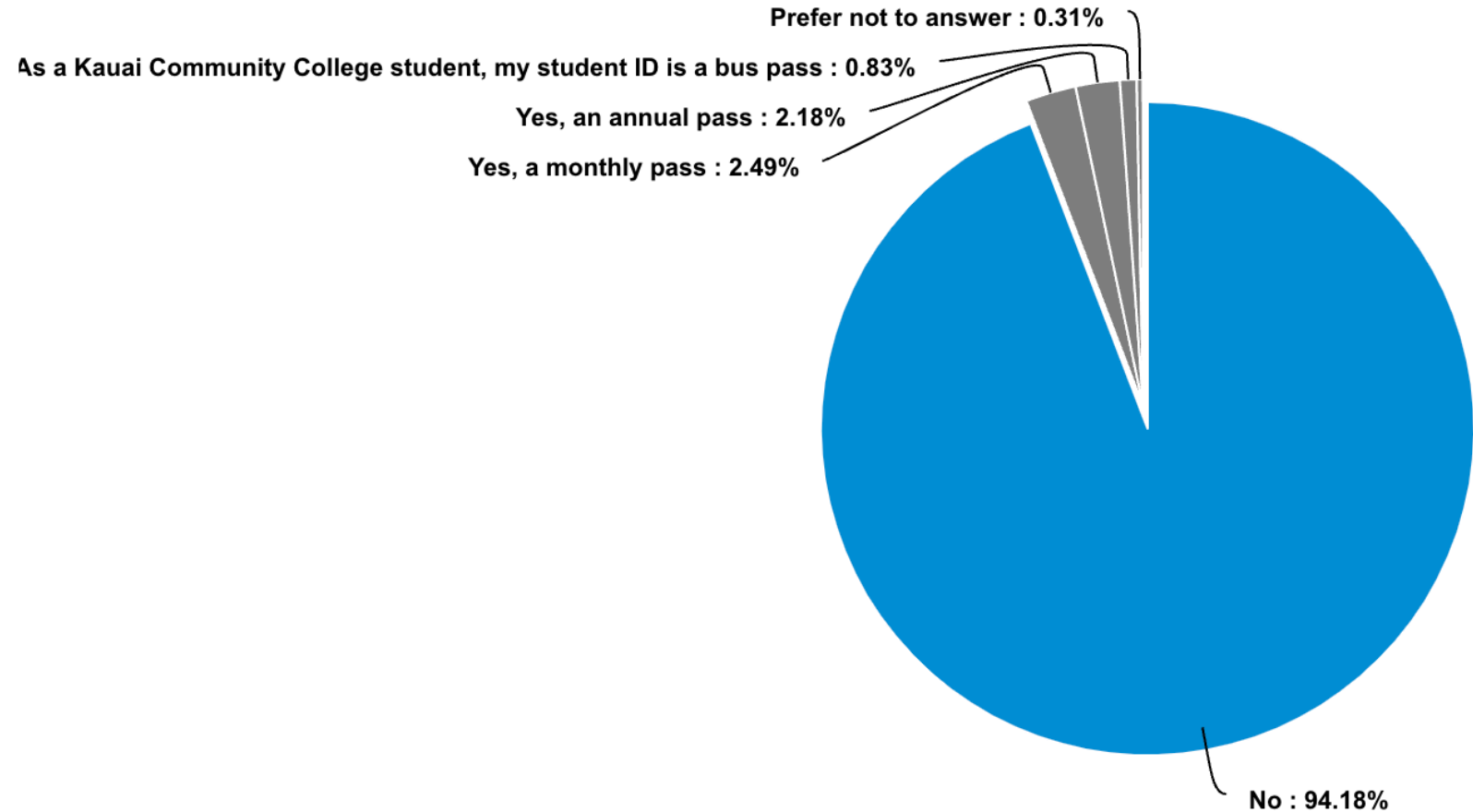


# Residents: Driver's License and Bus Pass

## Driver's License



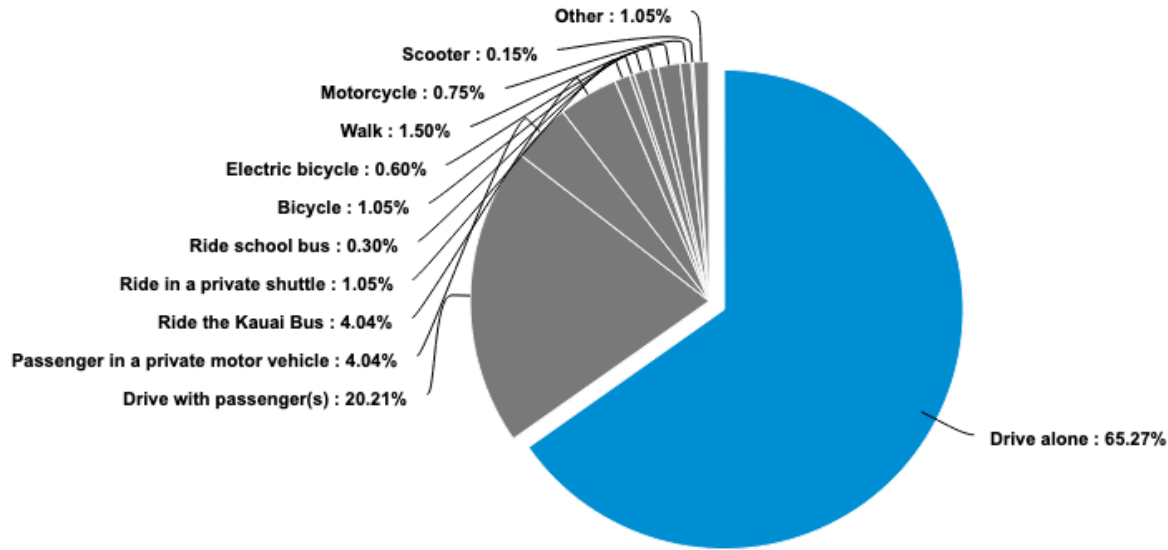
## Kauai Bus Pass



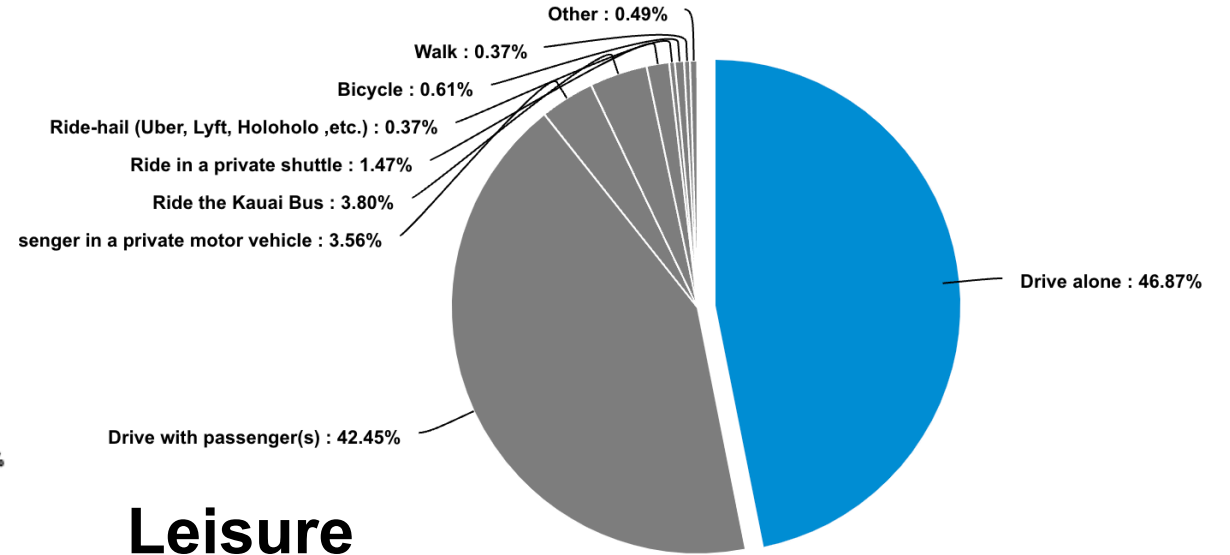


# Residents: Modes of Transportation

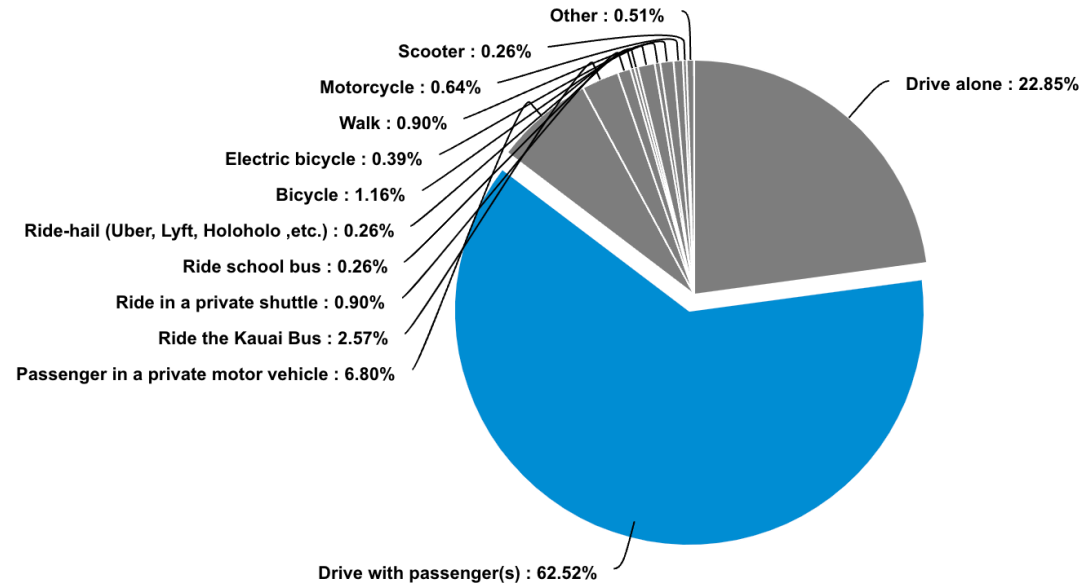
## Commuter



## Shopping



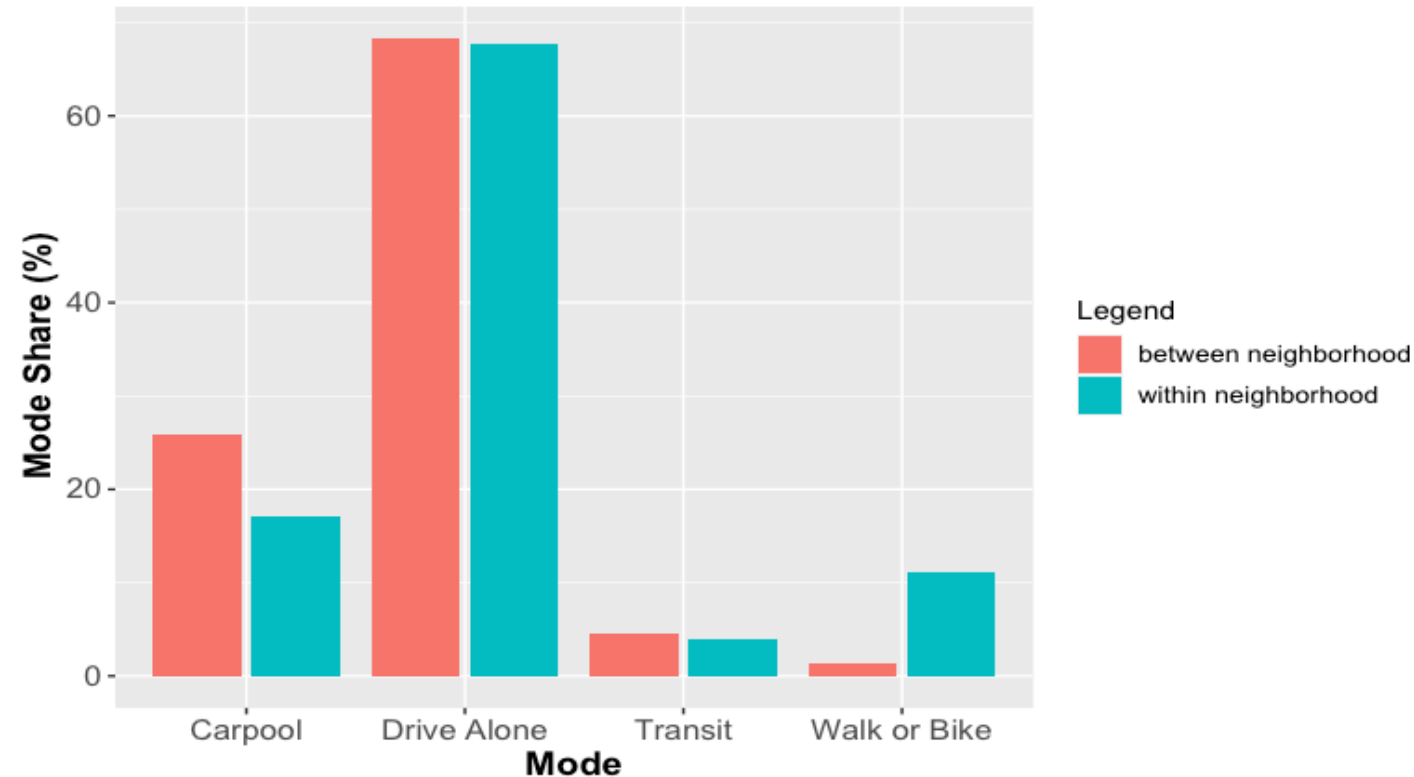
## Leisure



# Residents: Commute Modes and Locations

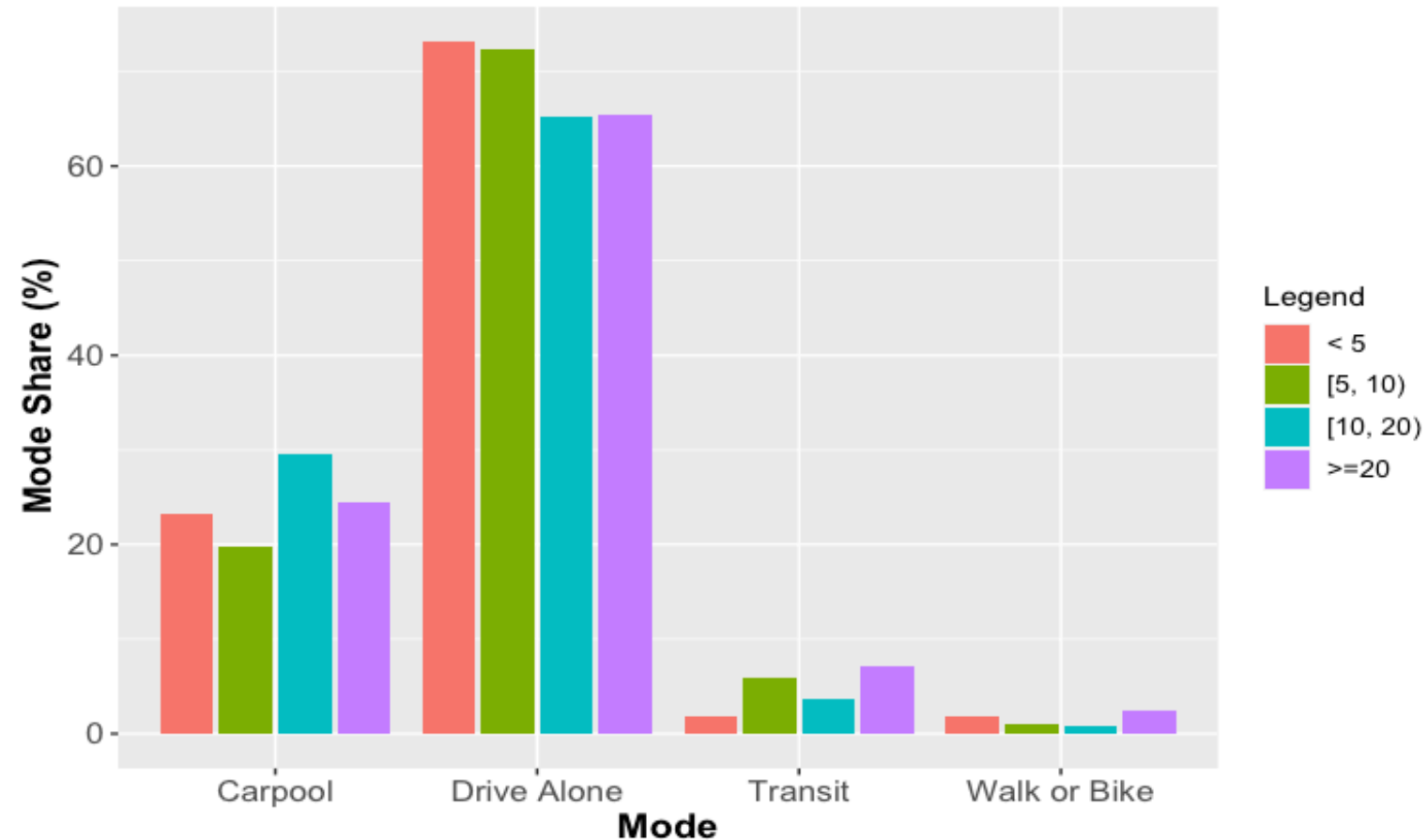
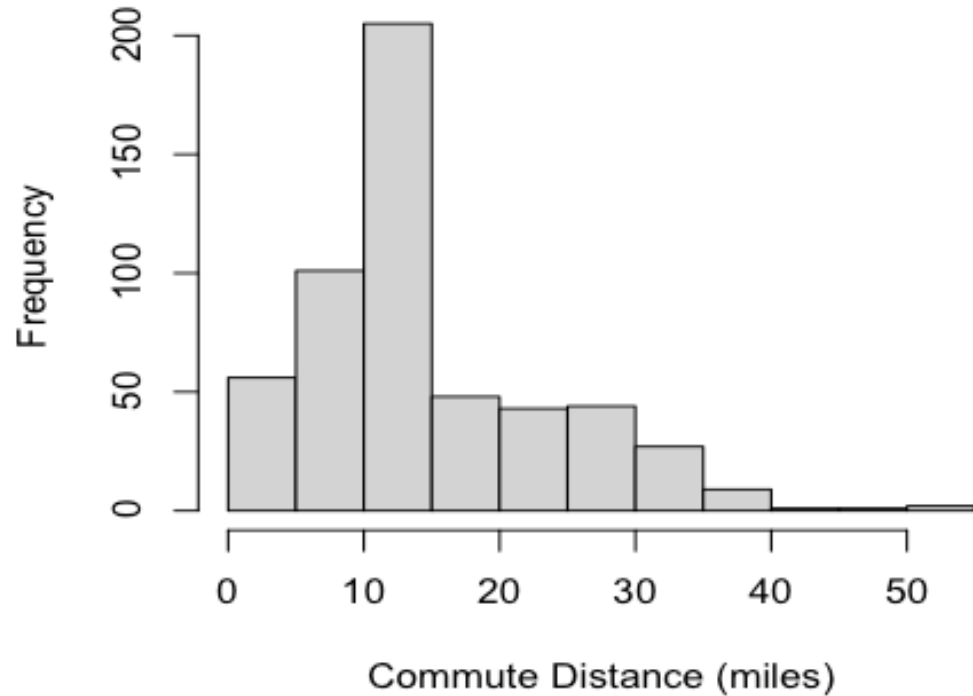
- a) Anahola
- b) Eleele
- c) Haena
- d) Hanalei
- e) Hanamaulu
- f) Hanapepe
- g) Lawai
- h) Lihue
- i) Kalaheo
- j) Kalihiwai
- k) Kapaa
- l) Kaumakani
- m) Kealia
- n) Kekaha
- o) Koloa
- p) Kilauea
- p) Mana (PMRF)
- q) Moloaa
- r) Omao
- s) Pakala Village
- t) Poipu
- u) Princeville
- v) Puhi
- w) Wailua
- x) Wailua Homesteads
- y) Waimea
- z) Wainiha
- aa) Other: \_\_\_\_\_
- bb) Prefer not to answer

mode	number of respondents
Carpool	189
Drive Alone	523
Transit	37
Walk or Bike	30

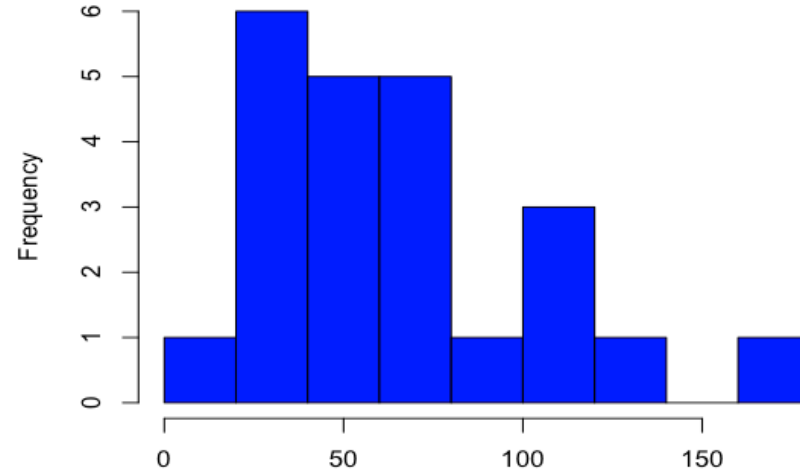
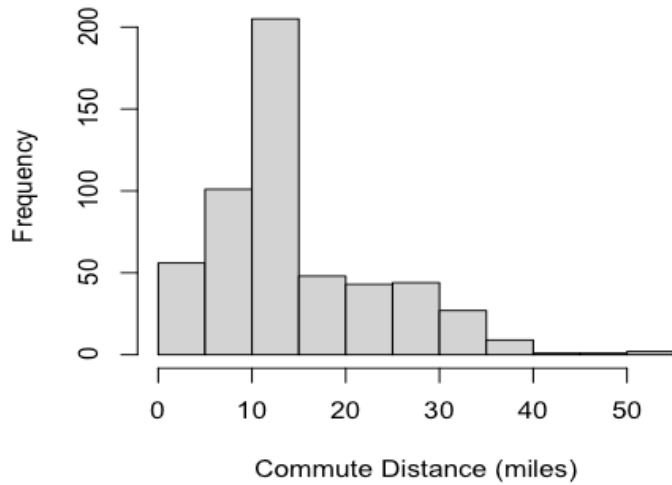


# Residents: Between-neighborhood Commute Modes by Trip Distance

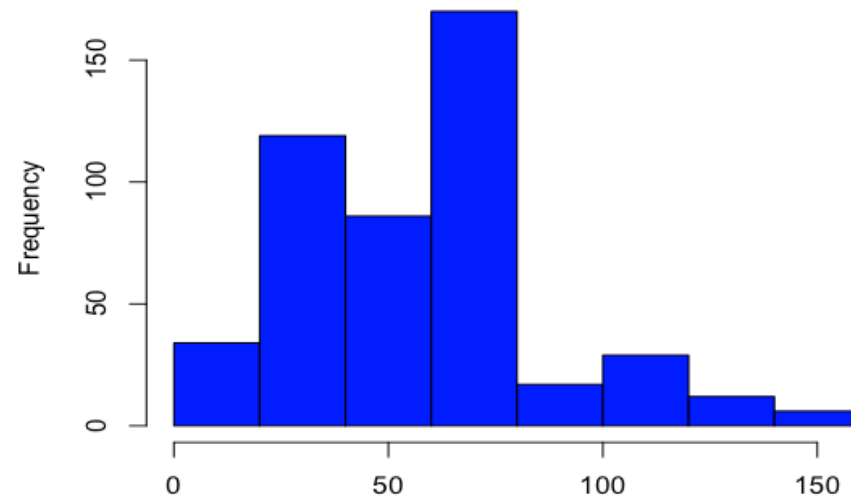
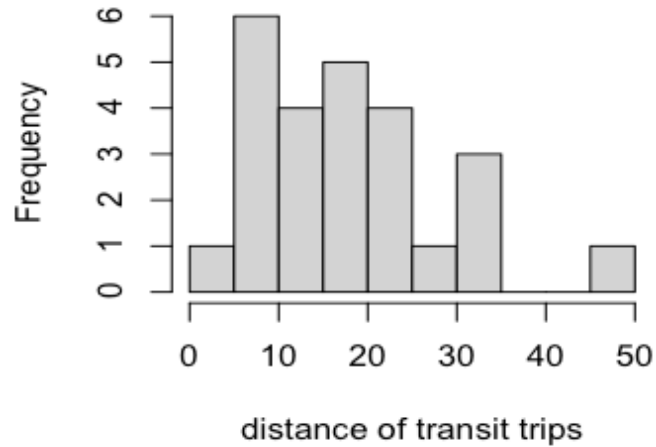
No consistent trend in how mode share changes by commute distance



# Residents: Between-neighborhood Commute Modes: Transit Travel Times

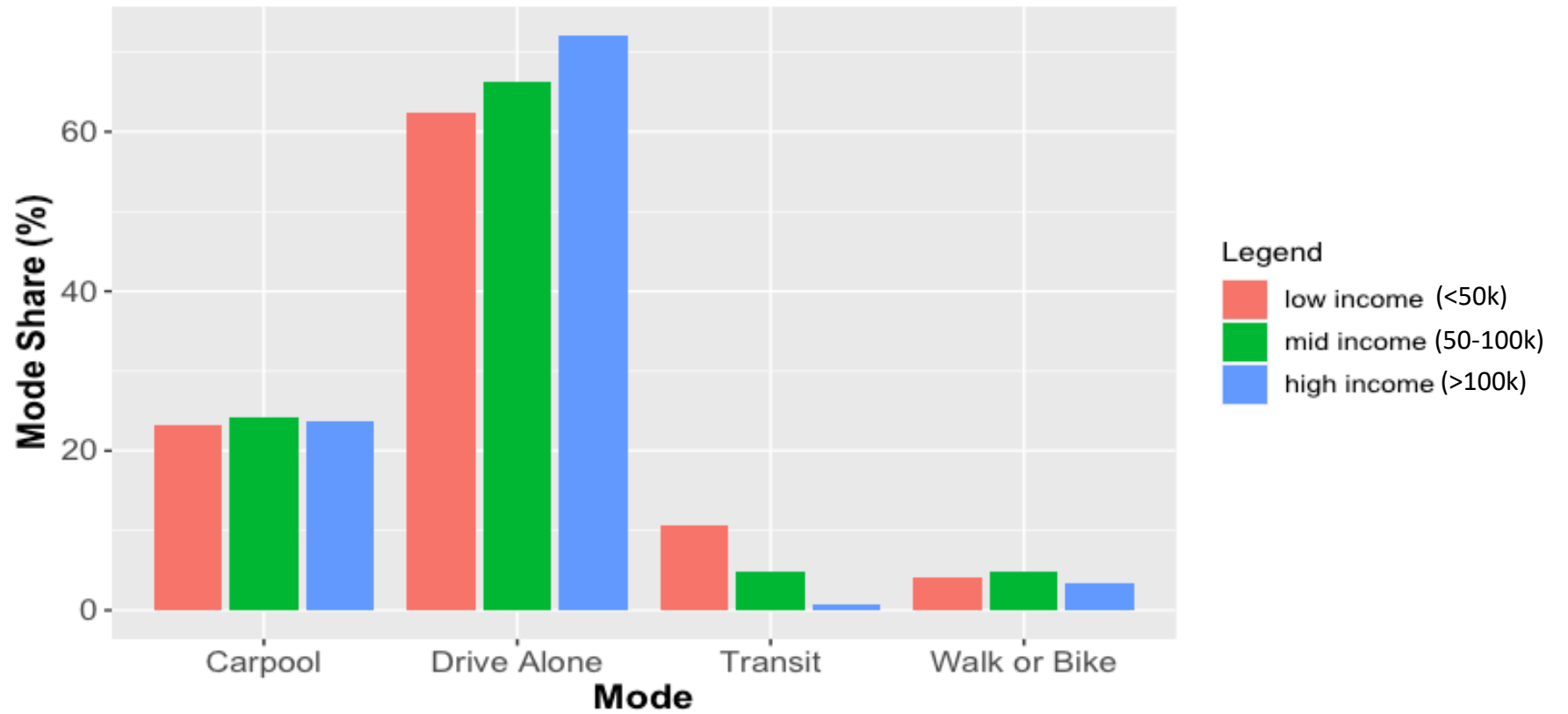


mode	number of respondents
Carpool	189
Drive Alone	523
Transit	37
Walk or Bike	30



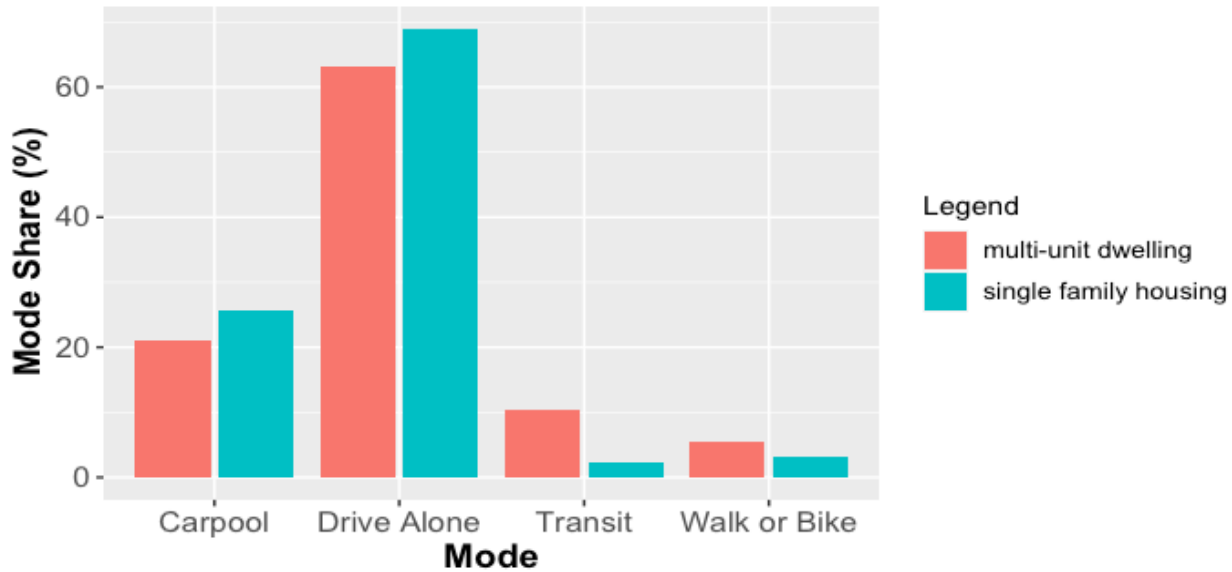
# Residents: Commute Modes by Household Incomes

- Lower income: More transit
- Higher income: More drive alone

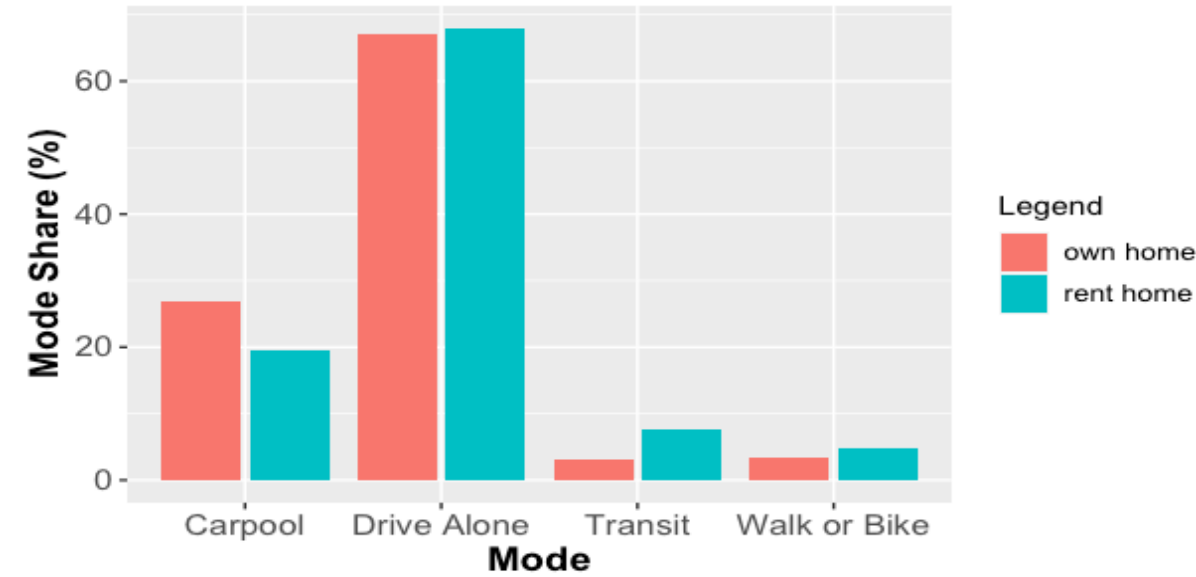


# Residents: Commute Modes by Housing Type and Tenure

## Housing Type and Commute Mode



## Housing Tenure and Commute Mode



# Transportation Preference Survey: Residents

- Income and housing are the deciding factors of transit use.
- Distance and transit time are not deciding factors of transit use.

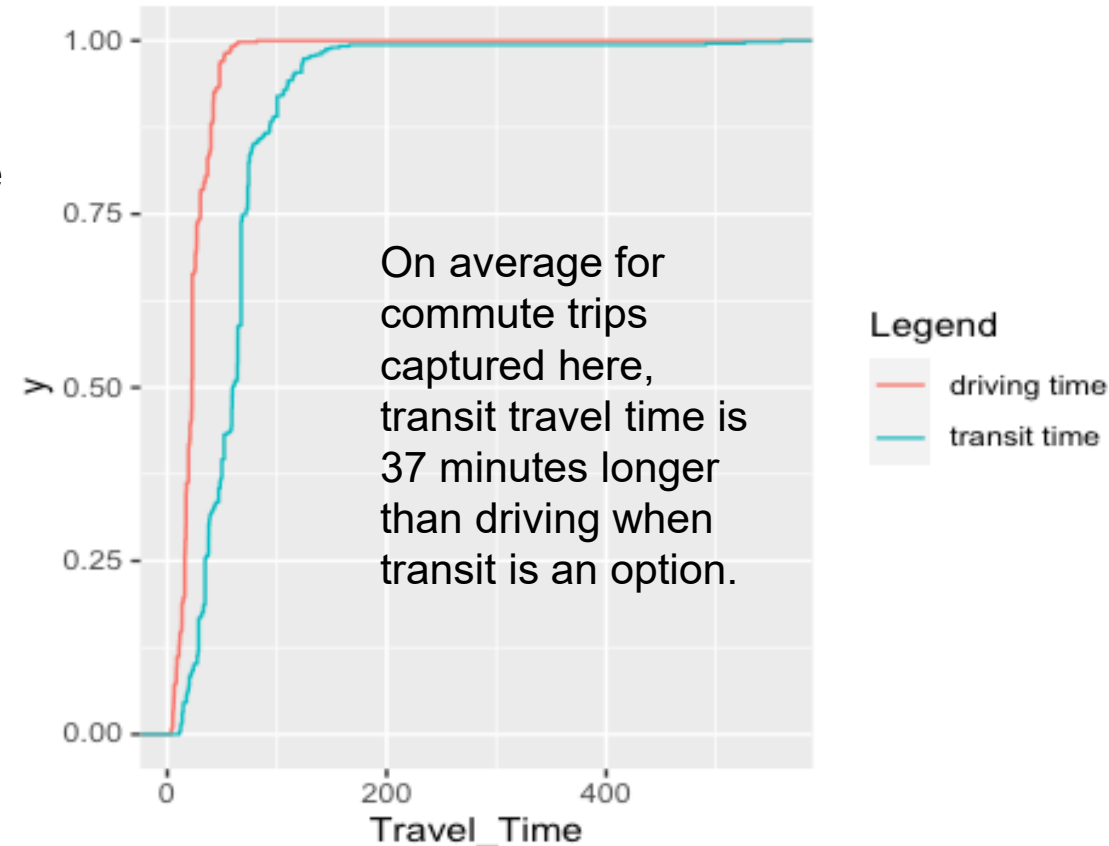
Our speculations on the possible explanations of these results:

## Possibility 1

Residents in Kauai do not want to use transit even when it is convenient.

## Possibility 2

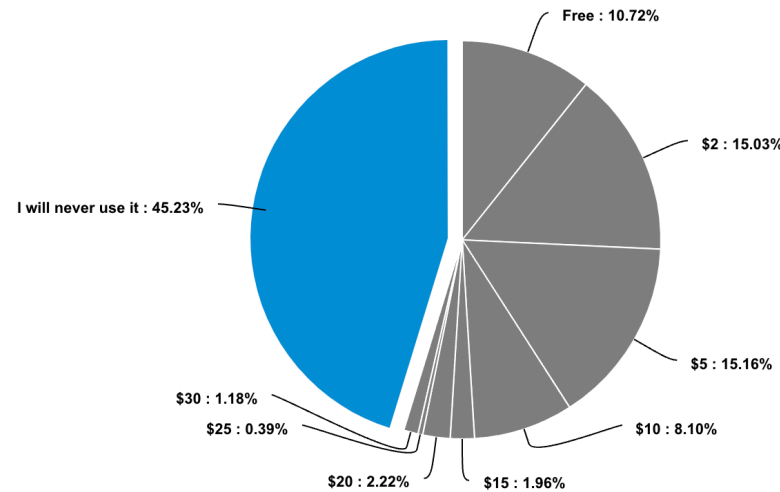
Current transit system is not robust enough to compete with driving.



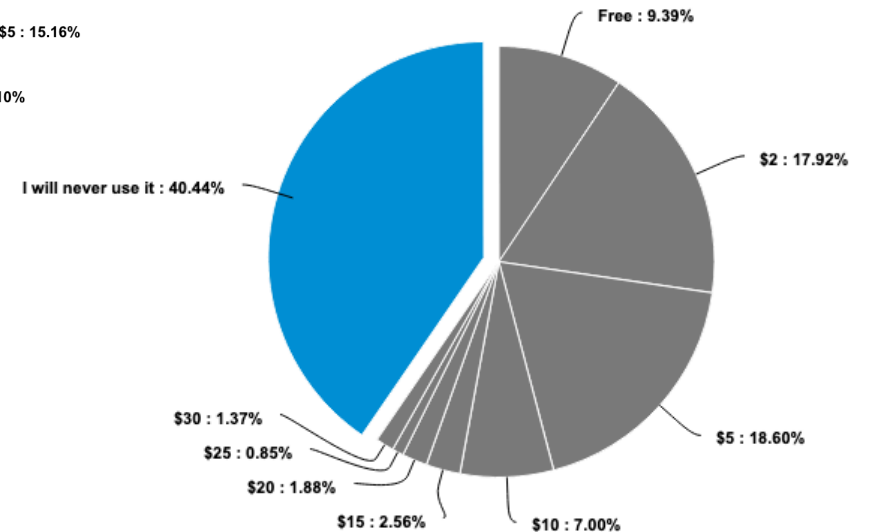
# Residents: Commute Trip Options Based on Cost

For this typical commute trip, imagine if there are the following new transportation services to choose from and the door-to-door travel time is about the same as your original mode, what is the highest price you would pay to use these new services to replace your original mode?

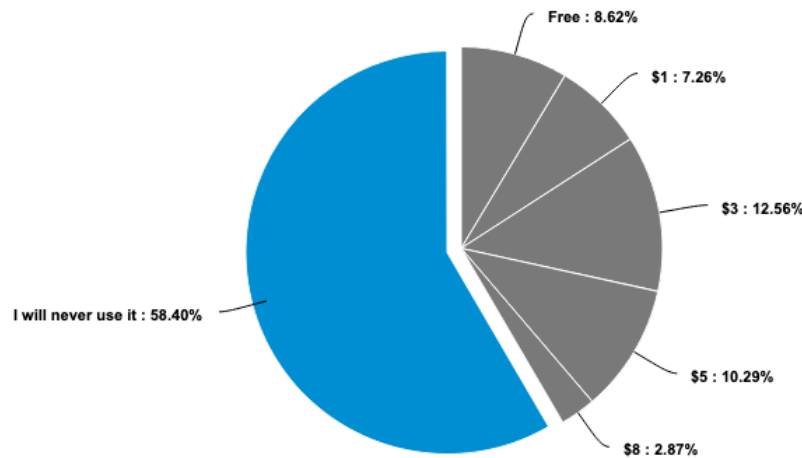
## Car Share



## Autonomous Vehicle (AV) Shuttle



## Bike/E-bike Share

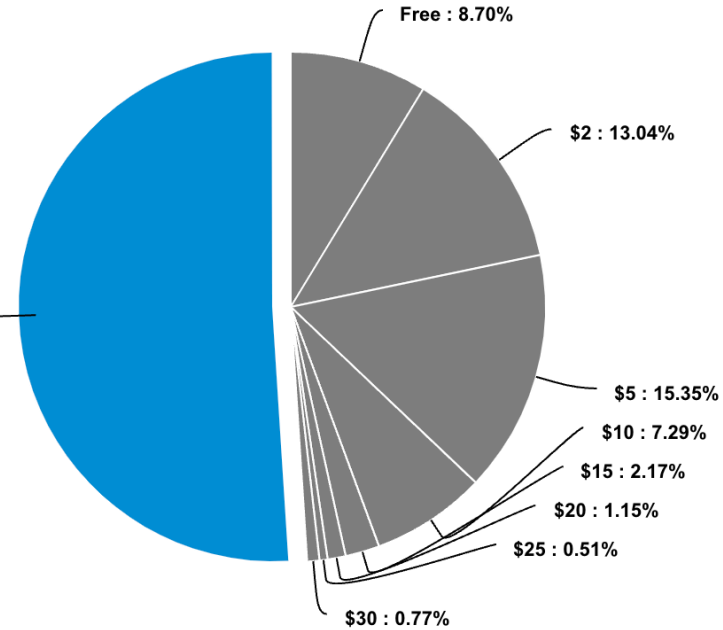




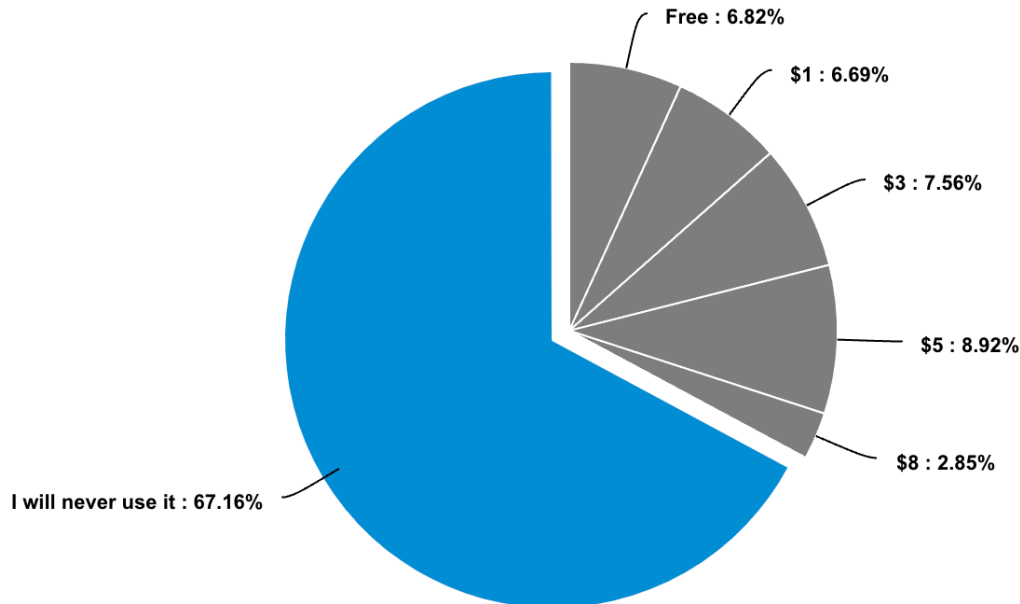
# Residents: Shopping Trip Options Based on Cost

For this typical shopping trip...

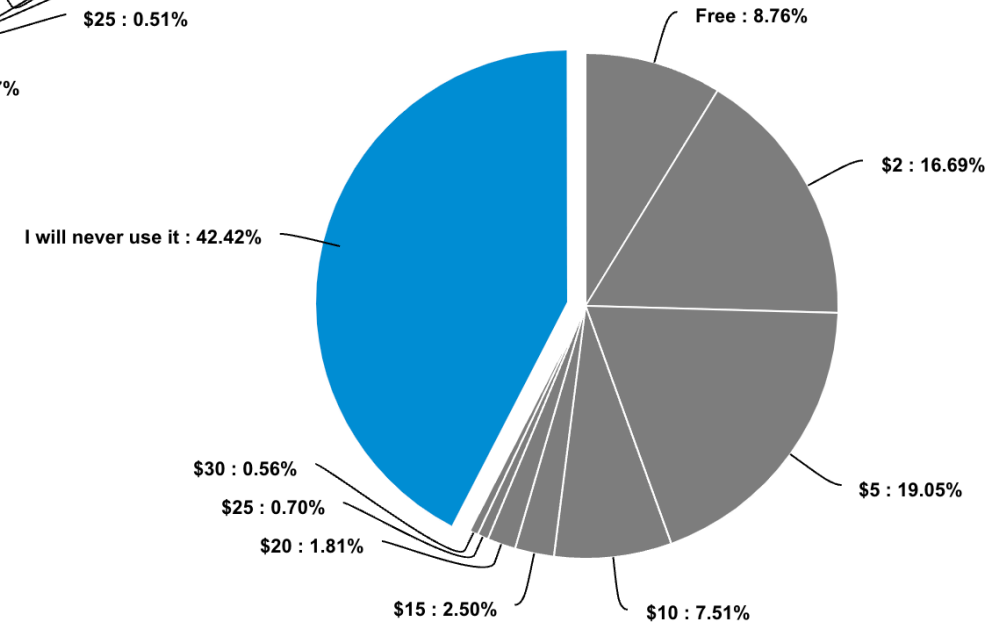
## Car Share



## Bike/E-bike Share



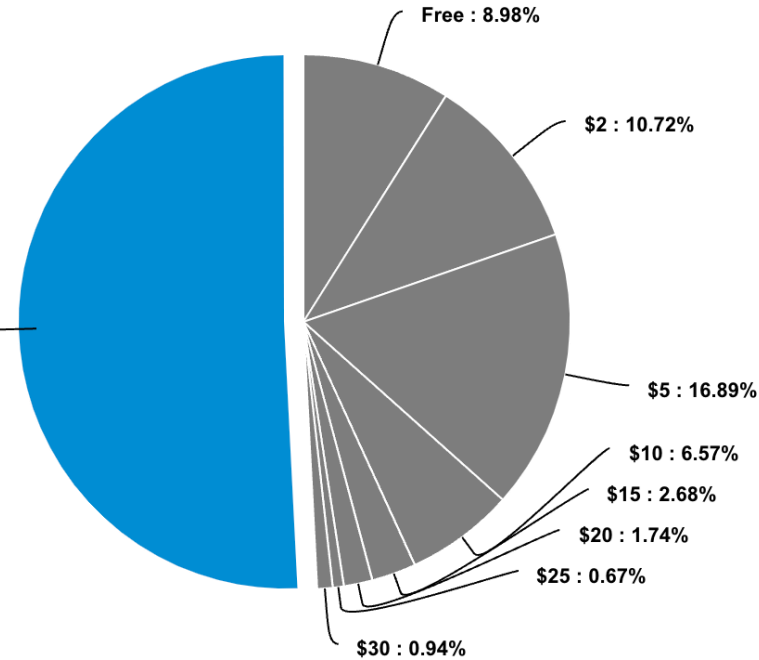
## AV Shuttle



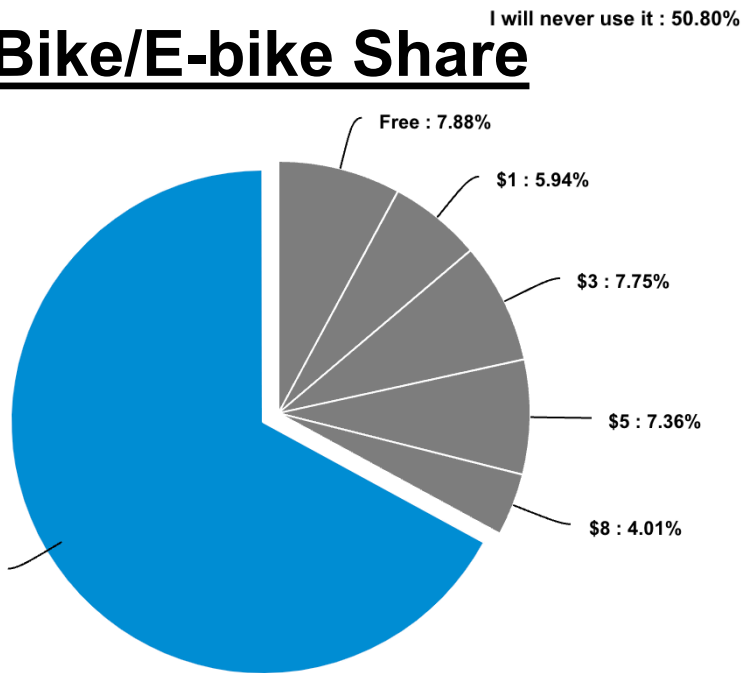
# Residents: Leisure Trip Options Based on Cost

For this typical leisure trip...

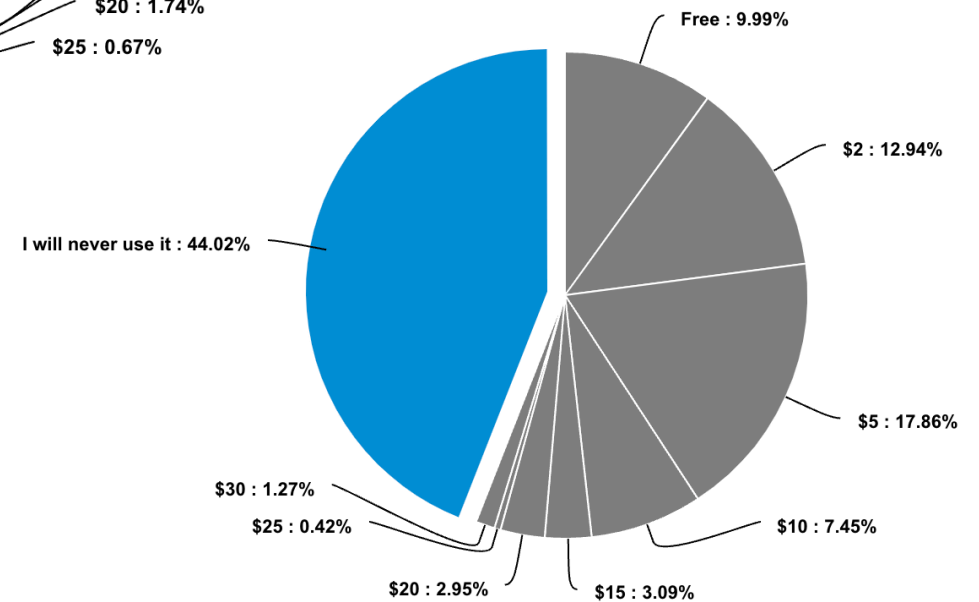
## Car Share



## Bike/E-bike Share

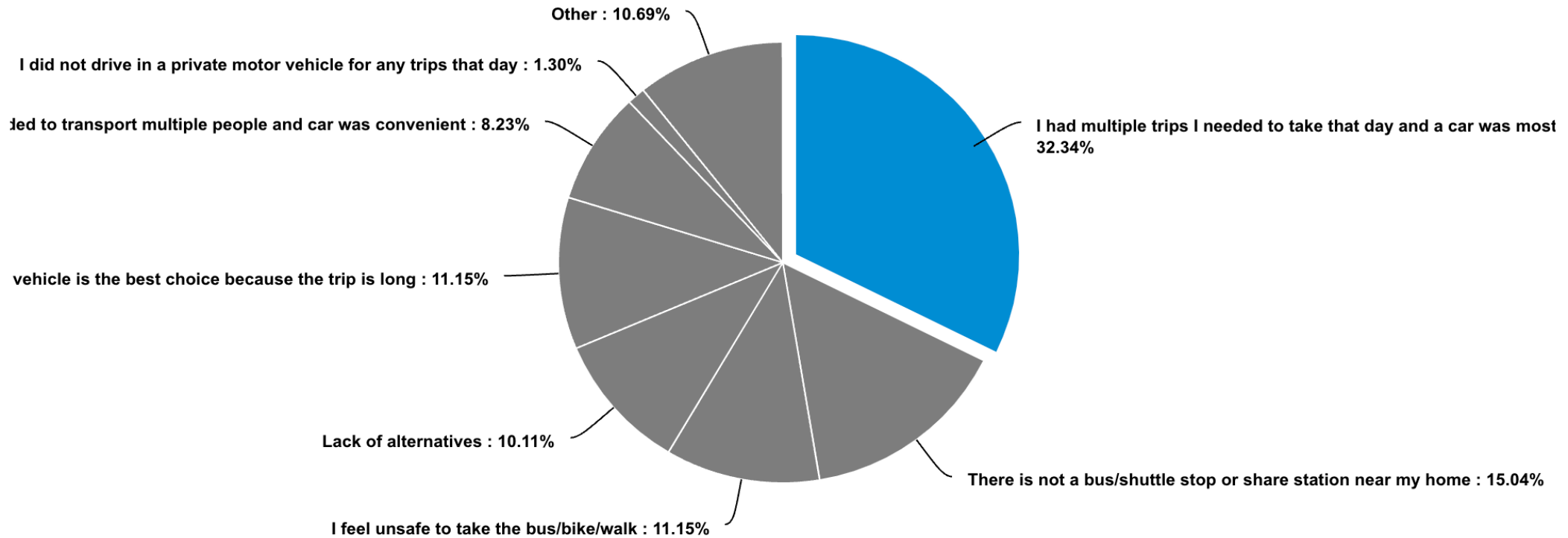


## AV Shuttle



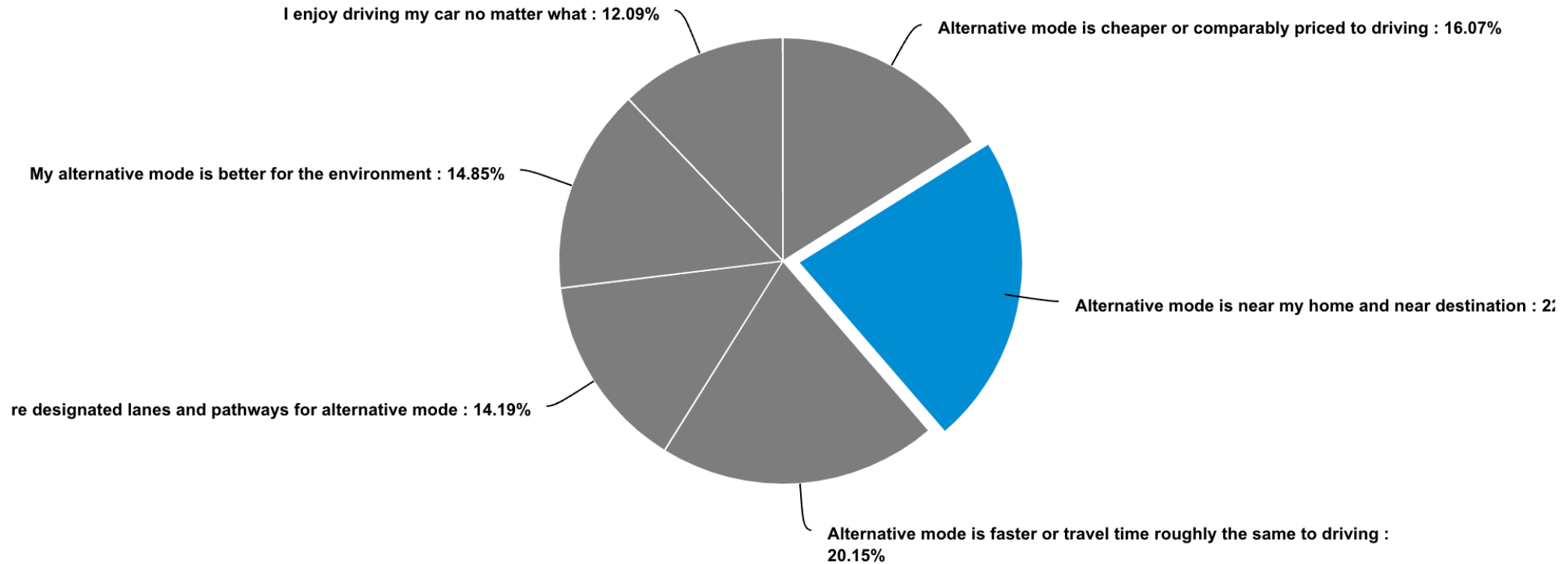
# Residents: Transportation Choices

If you drive or ride in a private motor vehicle for your typical weekdays, why do you choose this mode of transportation instead of using an alternative mode of transportation (bus, shuttle, bike, etc)? (Check all that apply)



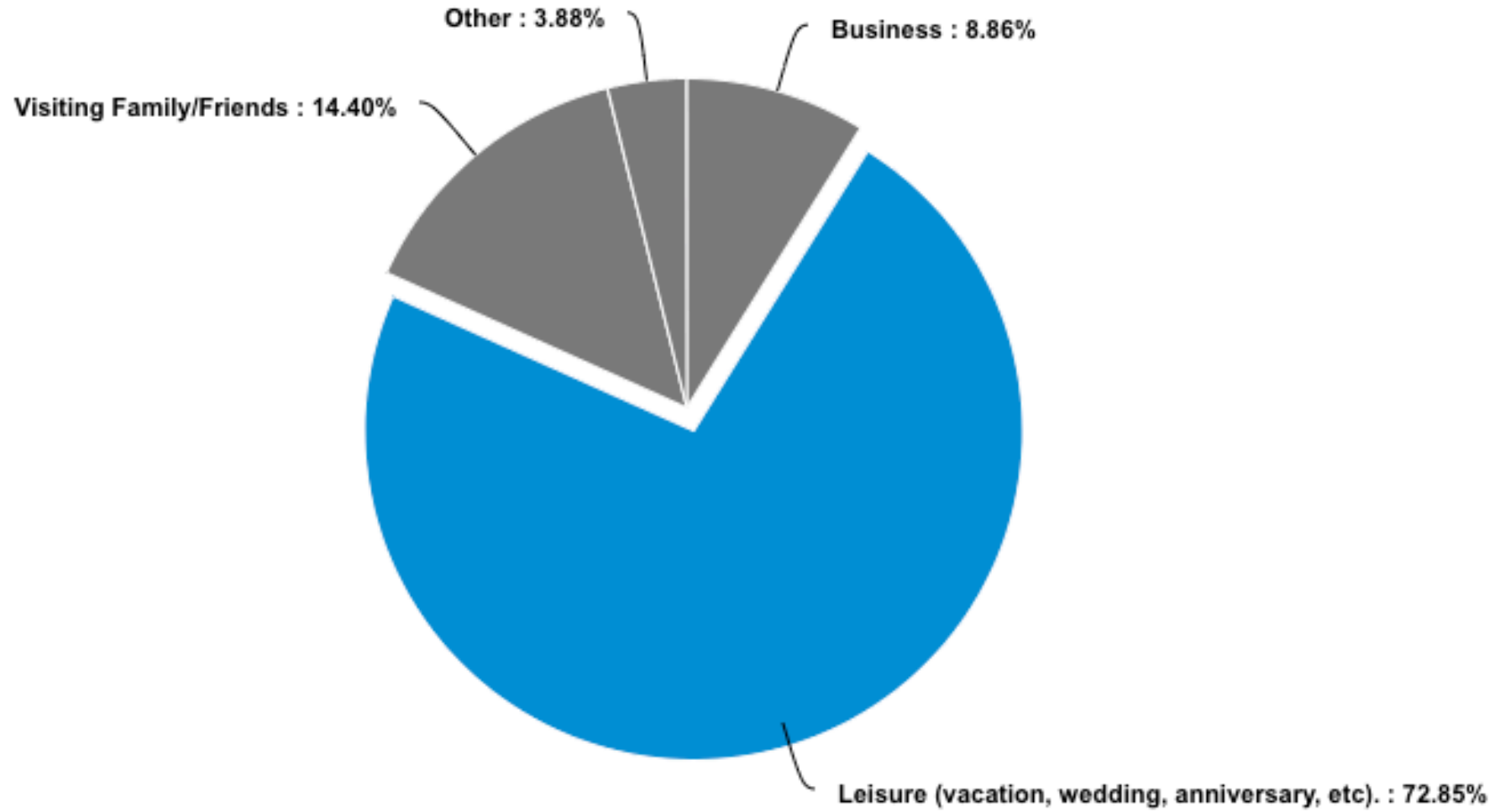
# Residents: Alternative Transportation Motivation

If you drive or ride in a private motor vehicle for your typical weekdays, what would get you out of a car and using an alternative mode of transportation? (Check all that apply)

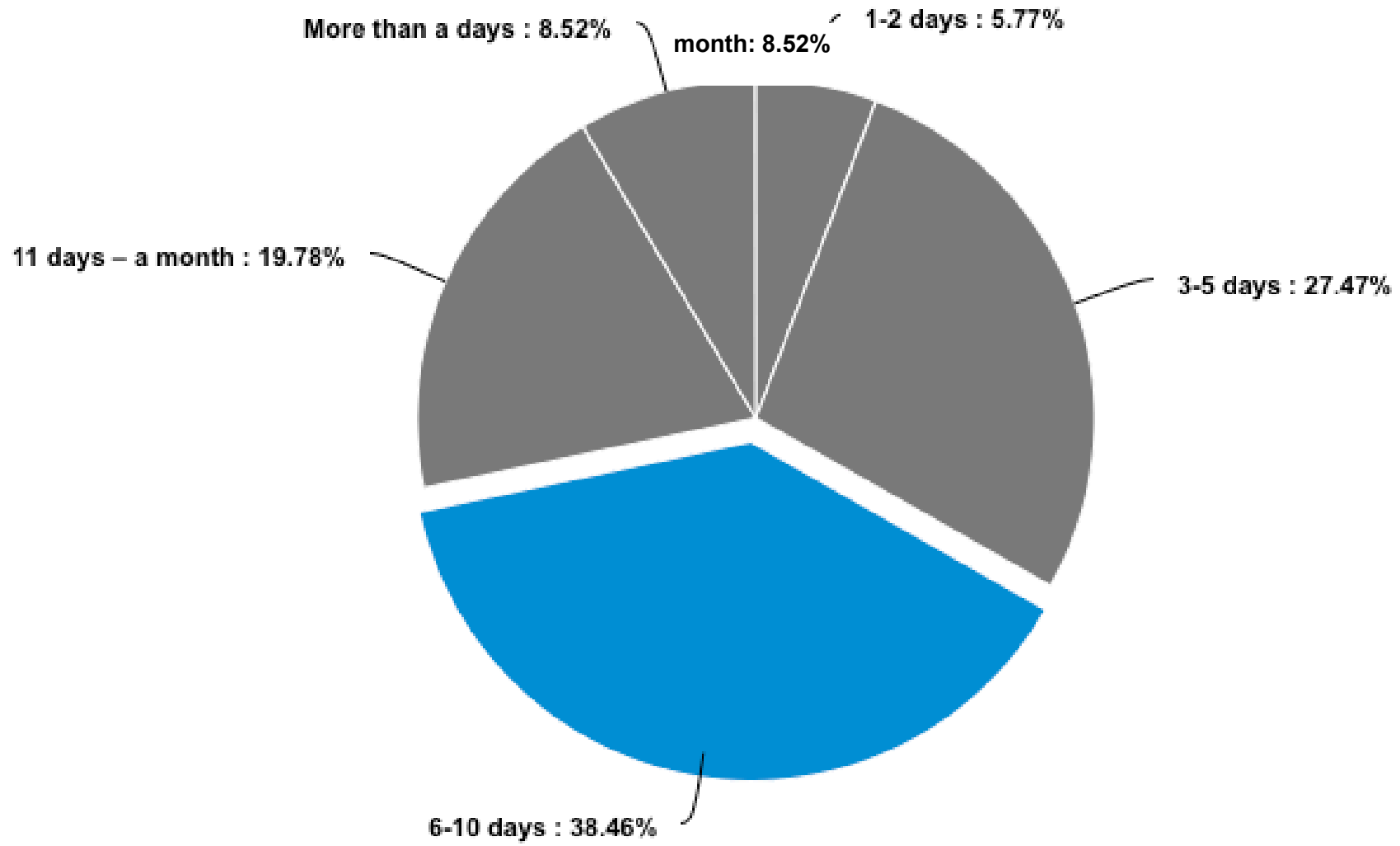


# **Transportation Preference Results: Visitors**

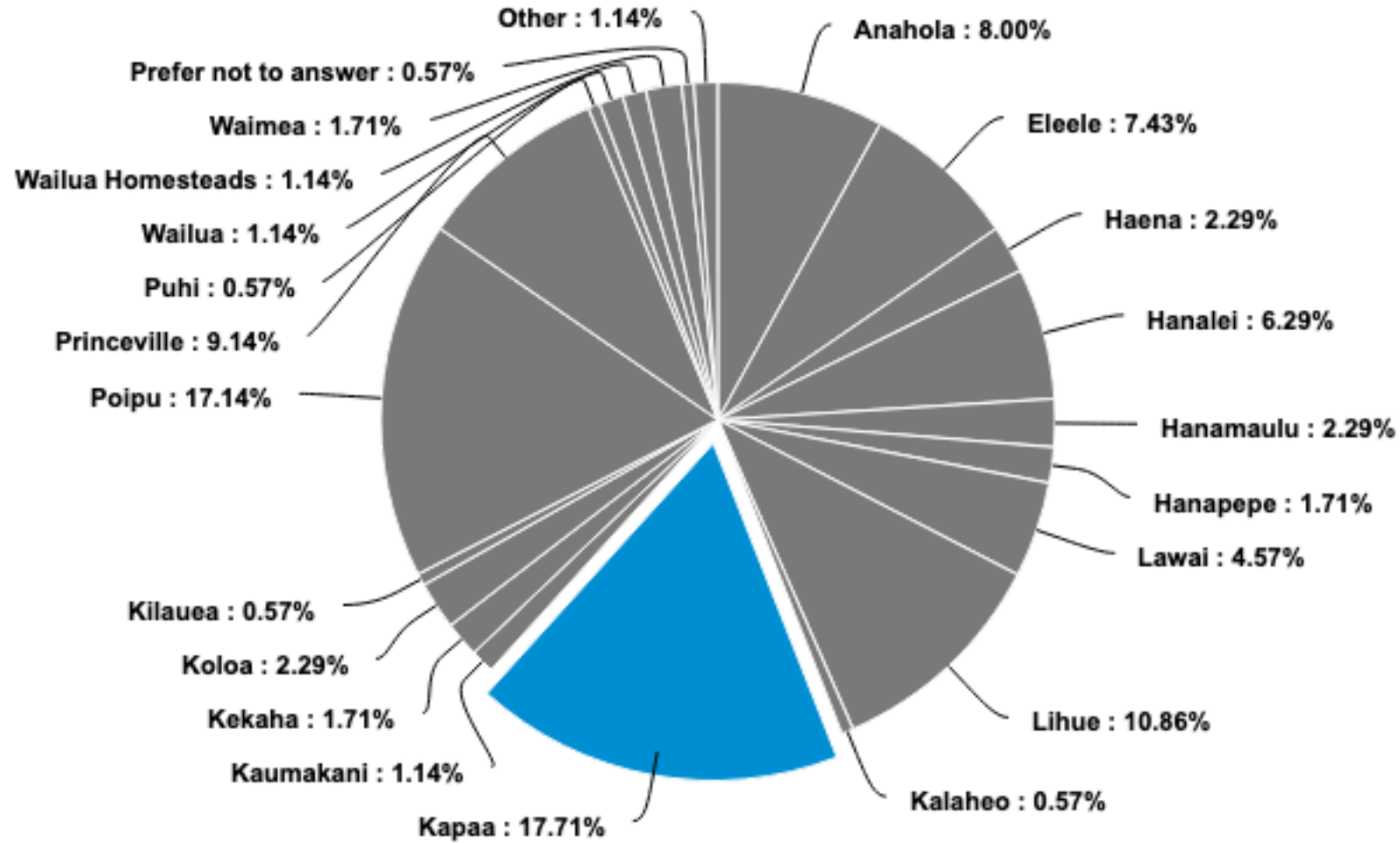
# Visitors: Purpose



# Visitors: Duration

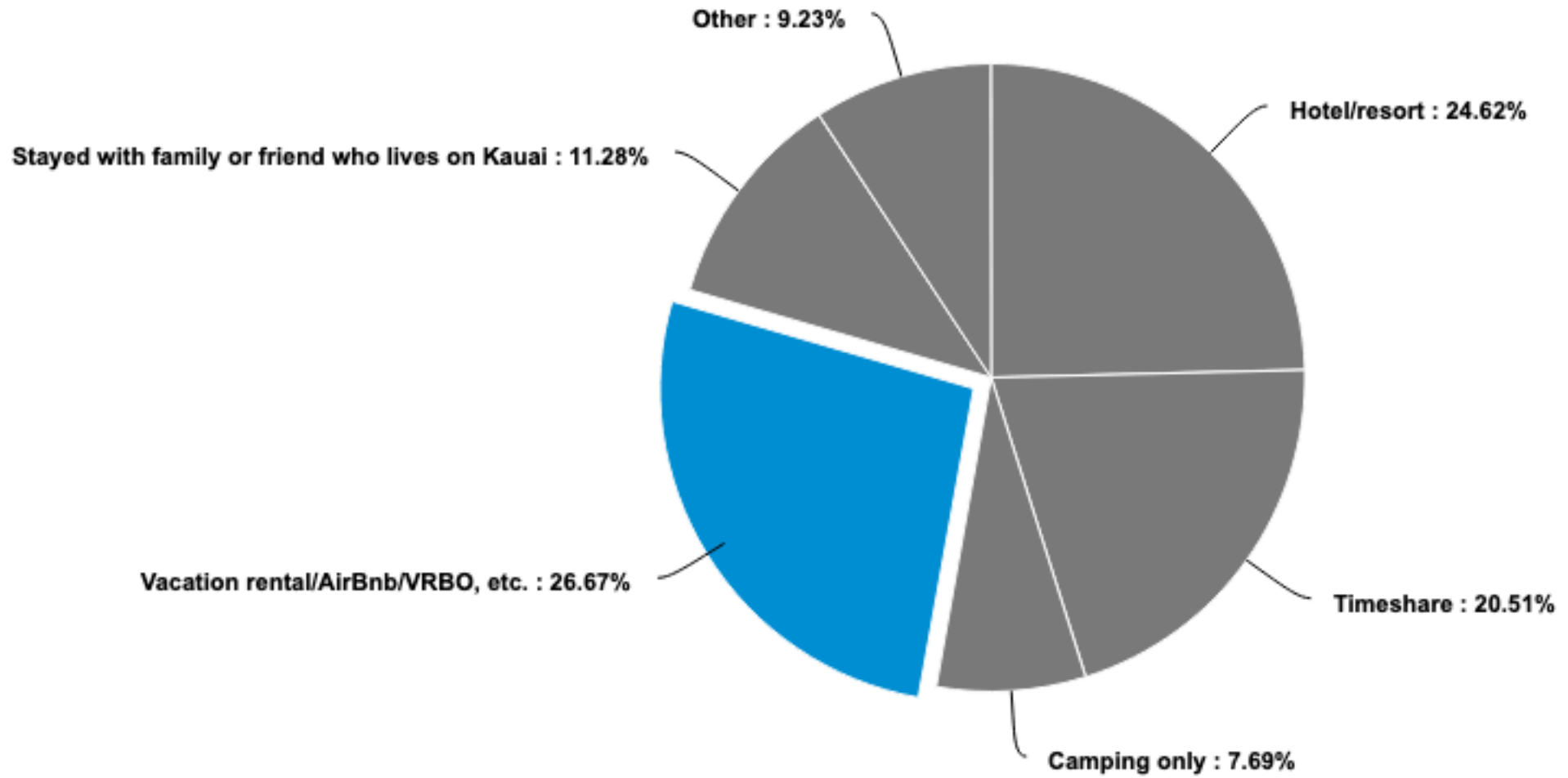


# Visitors: Lodging Location

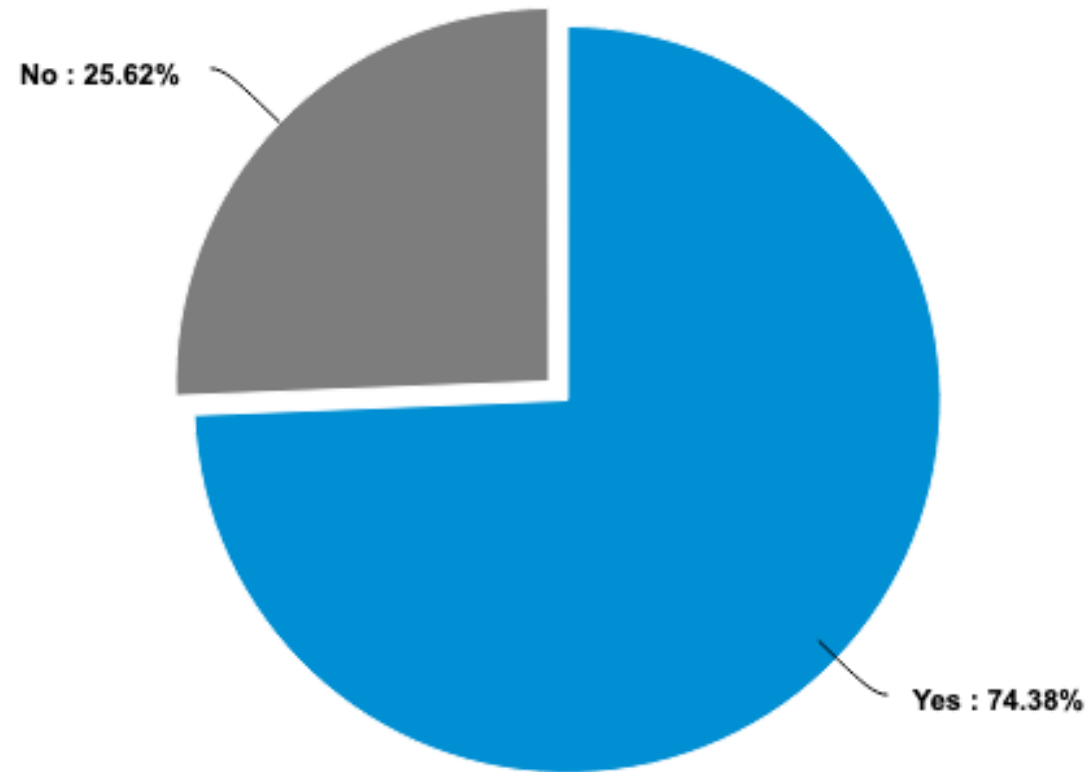




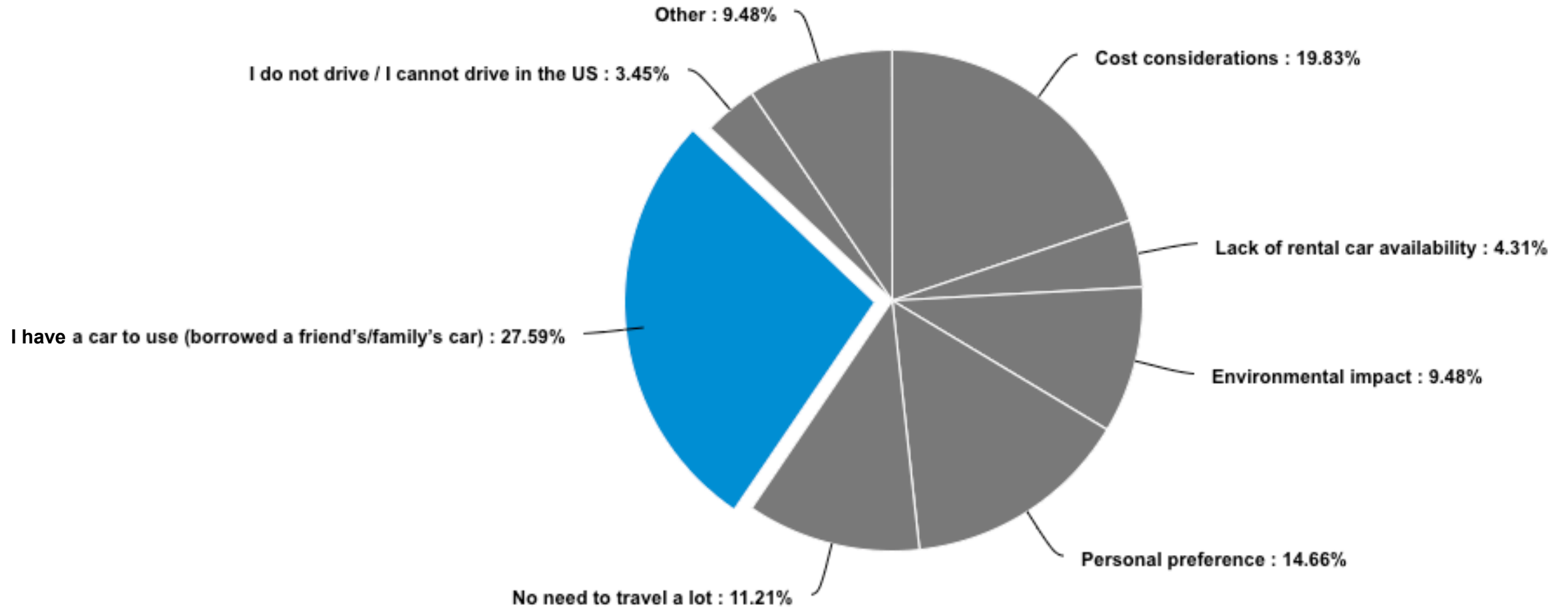
# Visitors: Lodging Type



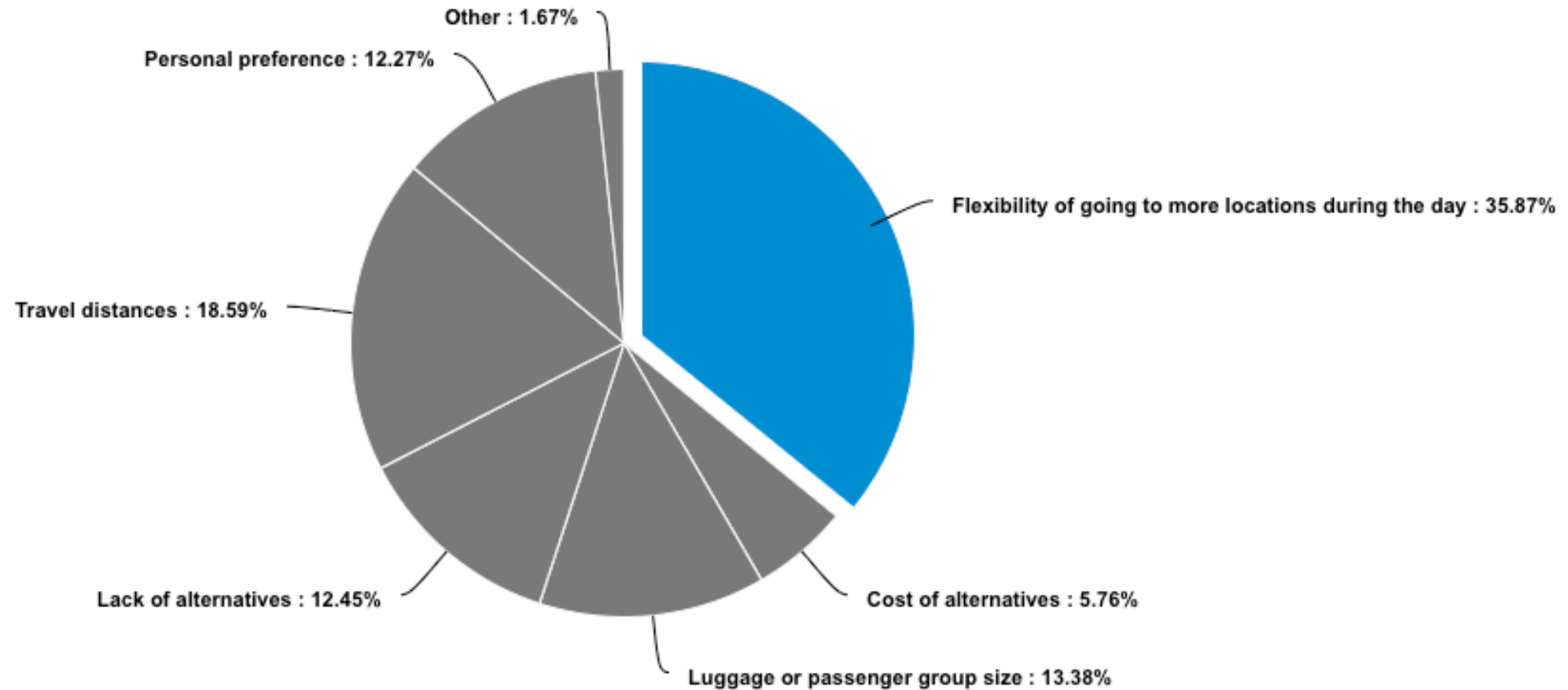
# Visitors: Did You Rent a Car?



# Visitors: Why Didn't You Rent a Car?



# Visitors: Why Did You Choose to Rent a Car?

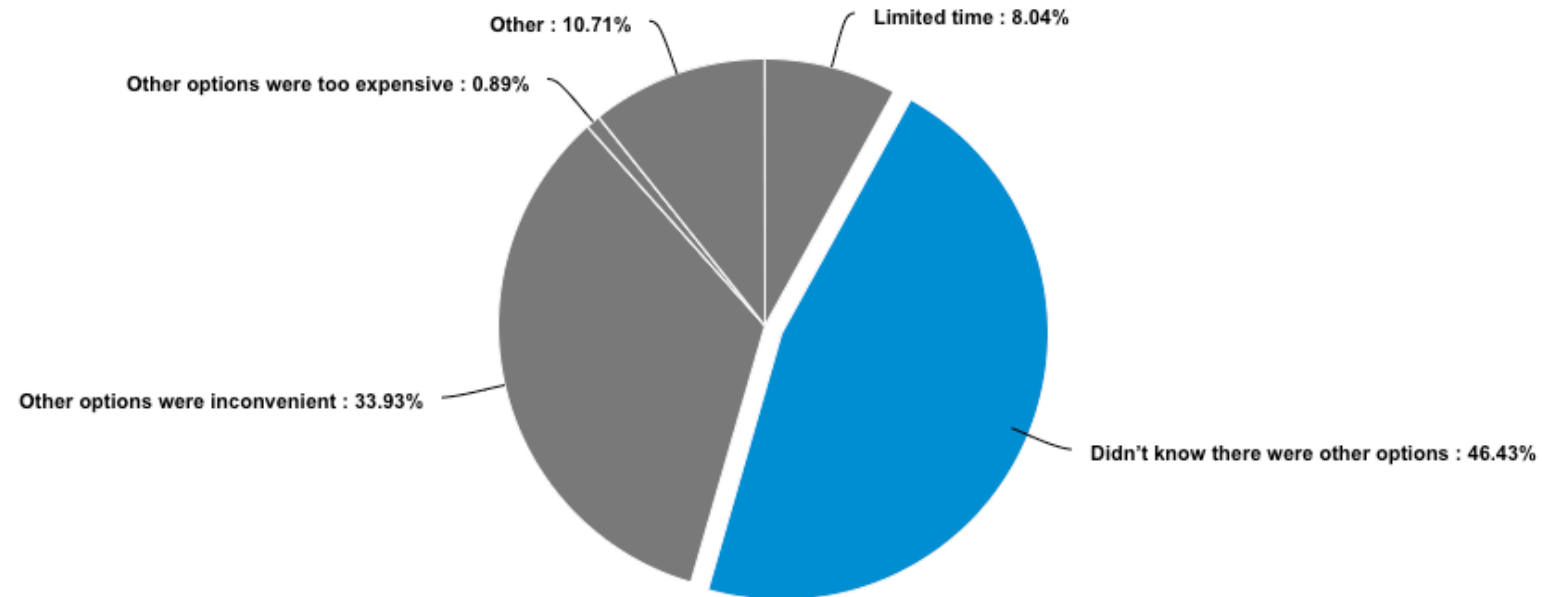


# Visitors: Transportation Options Research

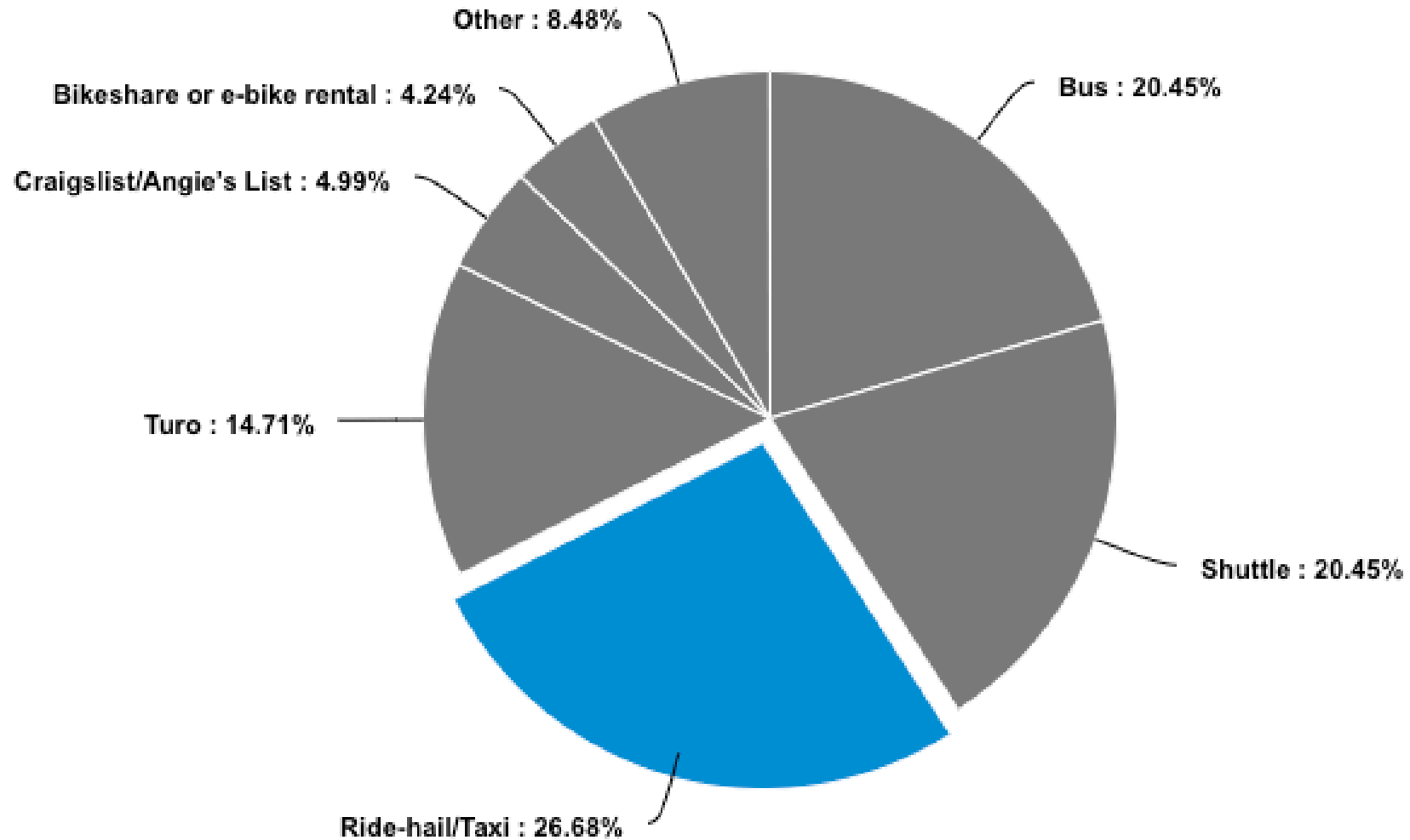
## Did you research other transportation options before renting a car?



## Why didn't you research other options?

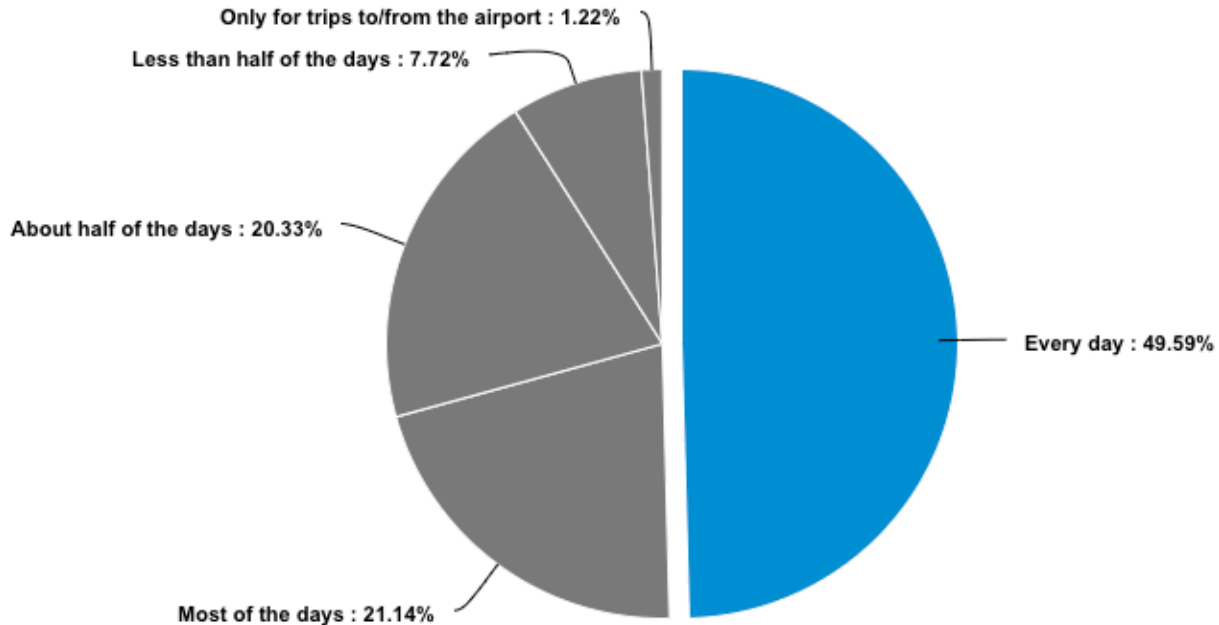


# Visitors: What Other Options Did You Research?

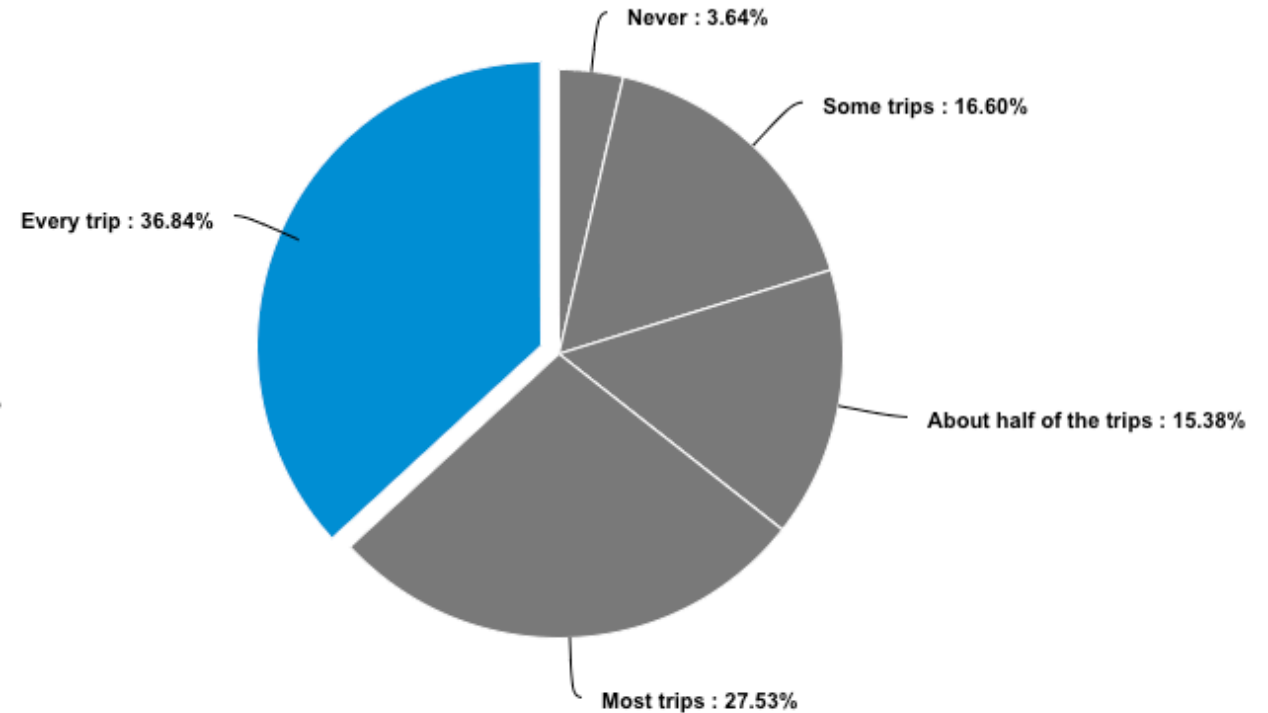


# Visitors: Number of Driving Days and Trips

For how many days did you drive your rental car during your visit?

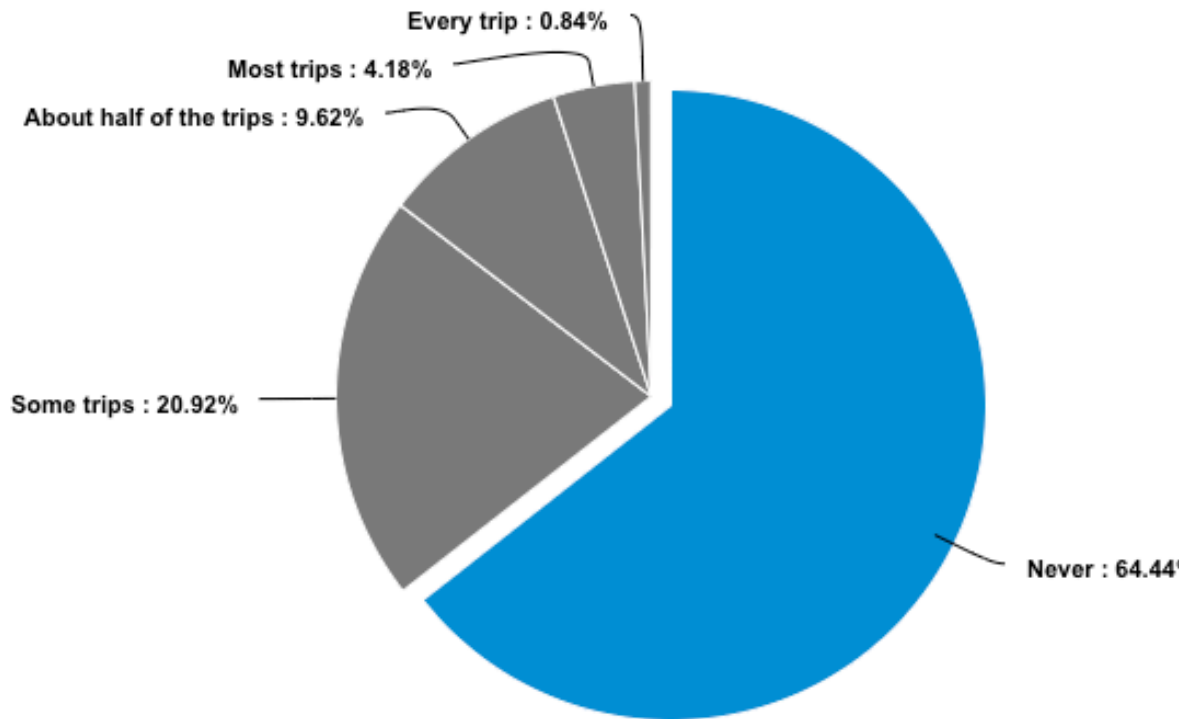


How many trips by rental car?

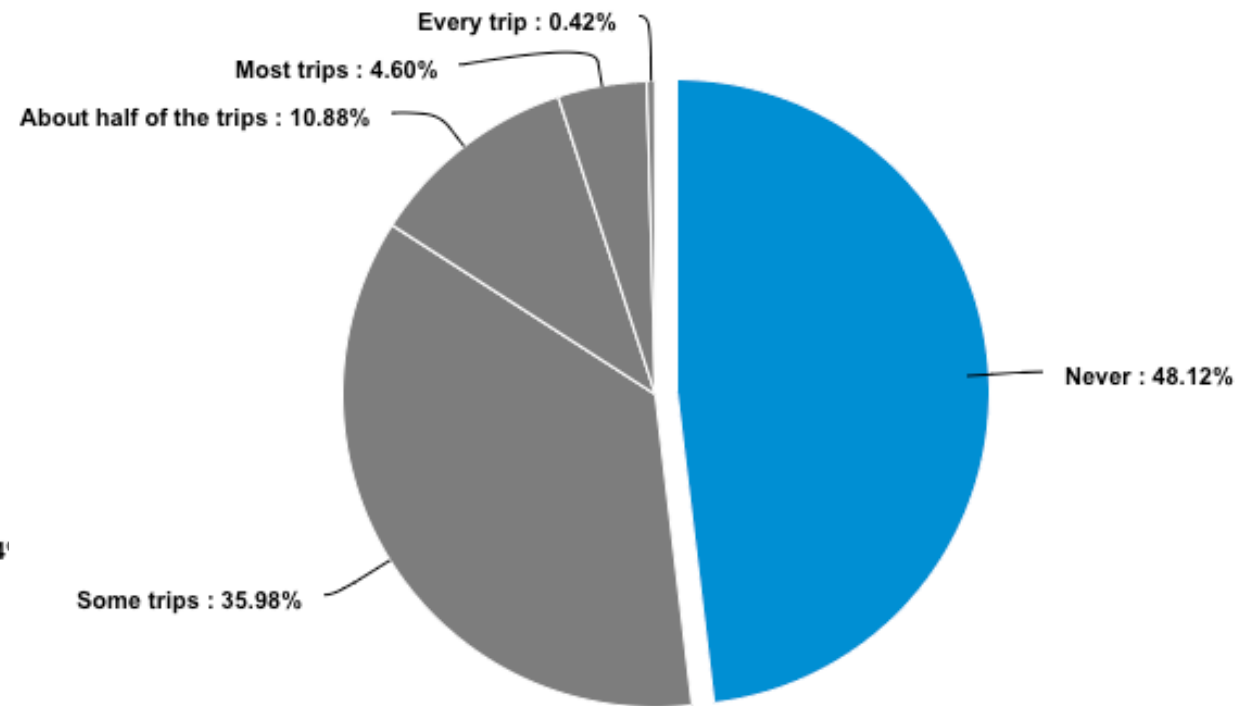


# Visitors: Bus and Shuttle Trips

## How many trips by bus?



## How many trips by shuttle?

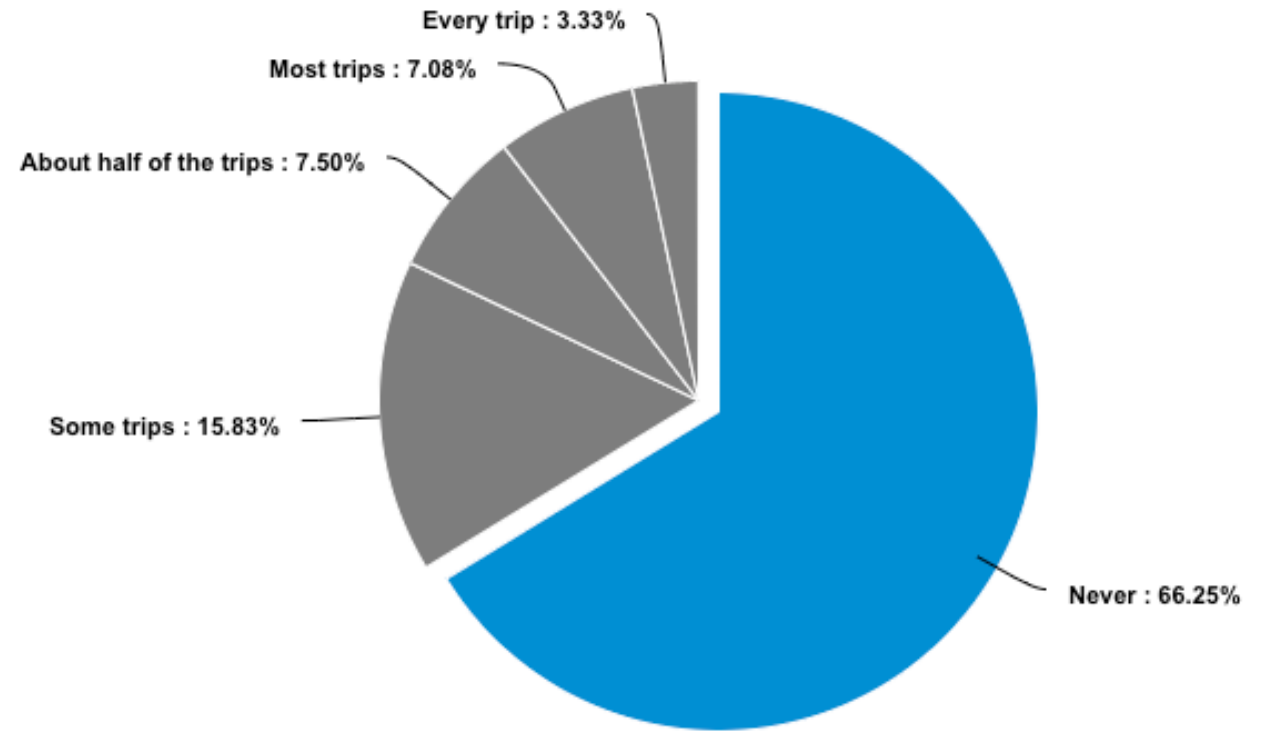
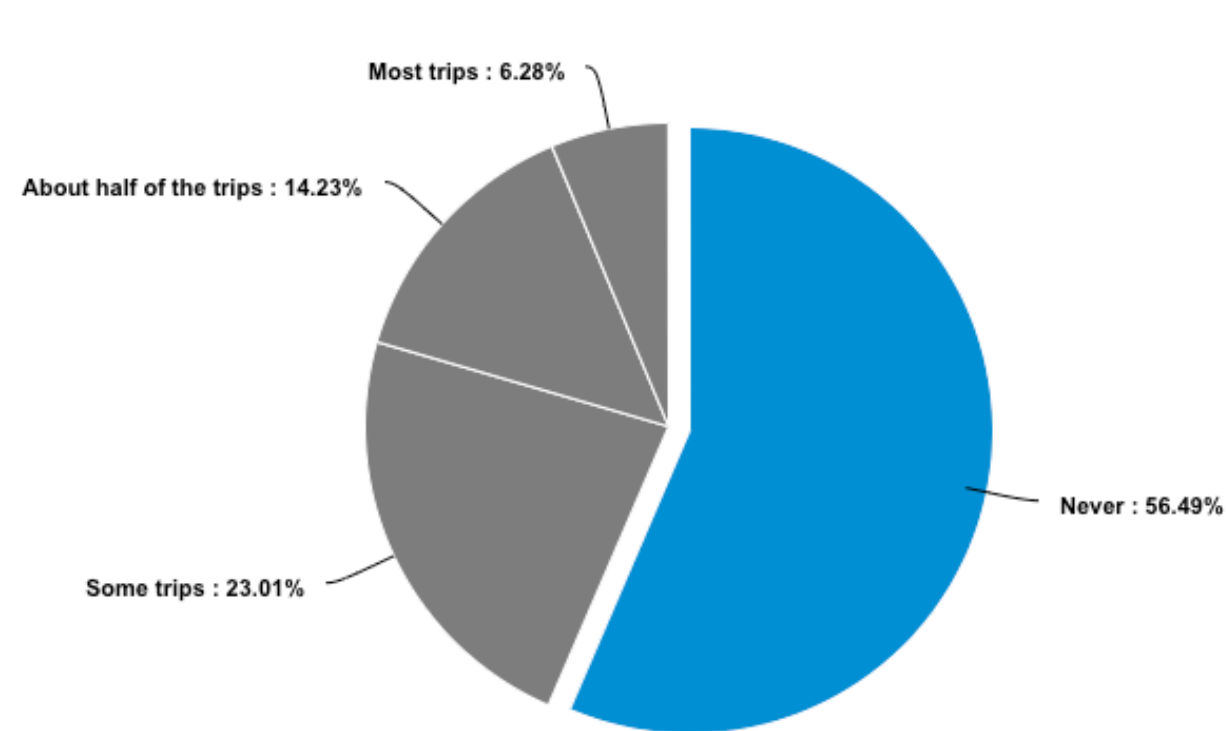




# Visitors: Ride-hail/Taxi and Turo Trips

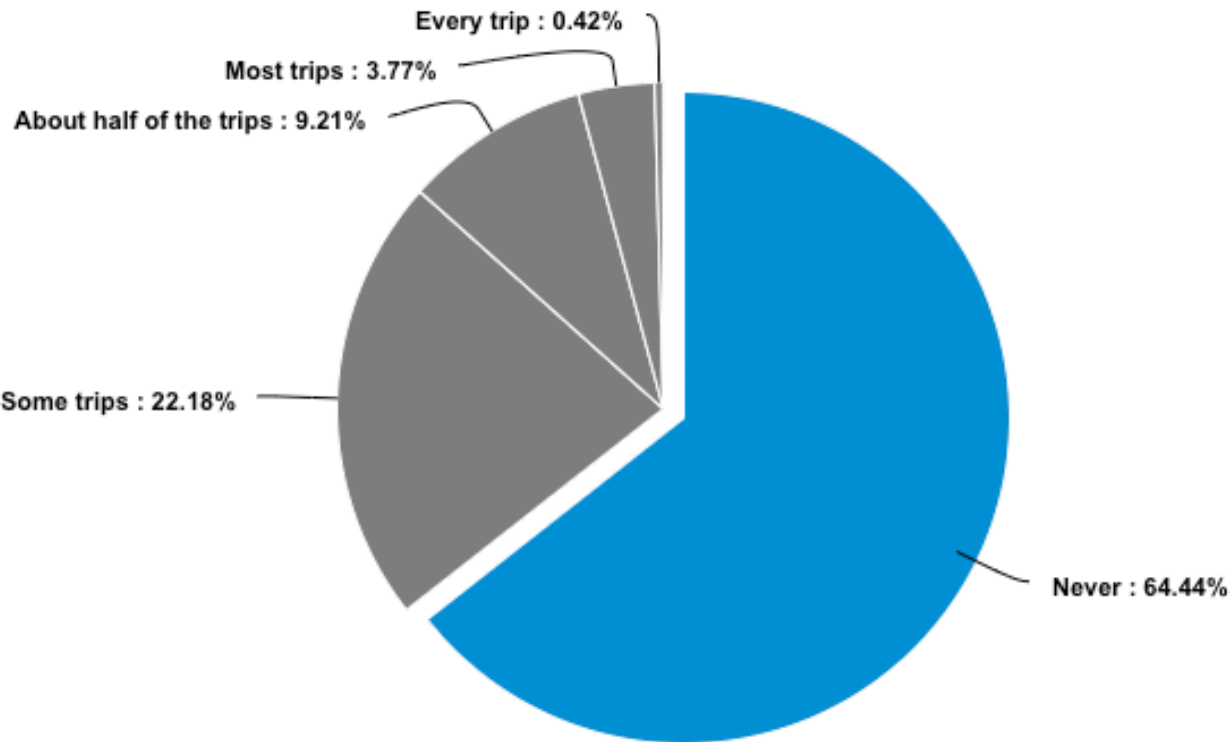
## How many trips by ride-hail/taxi?

## How many trips by Turo?

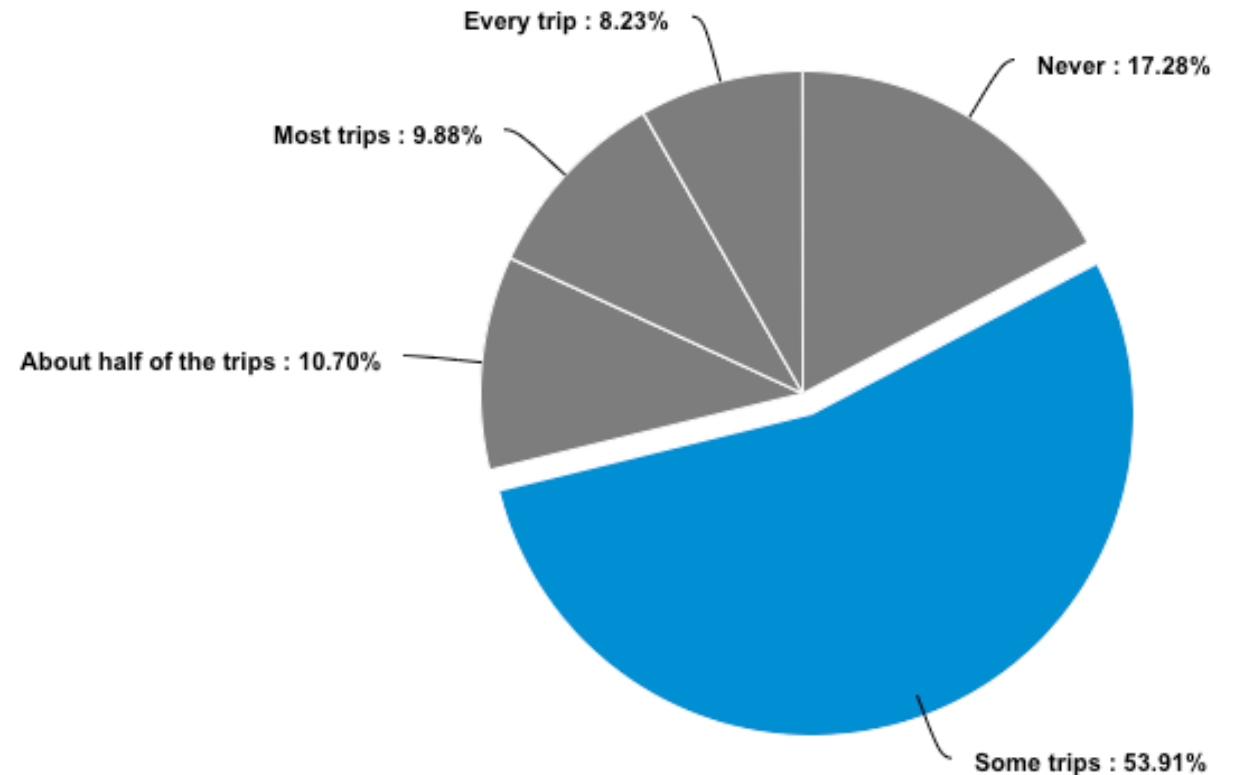


# Visitors: Bike and Walking Trips

## How many trips by bike?

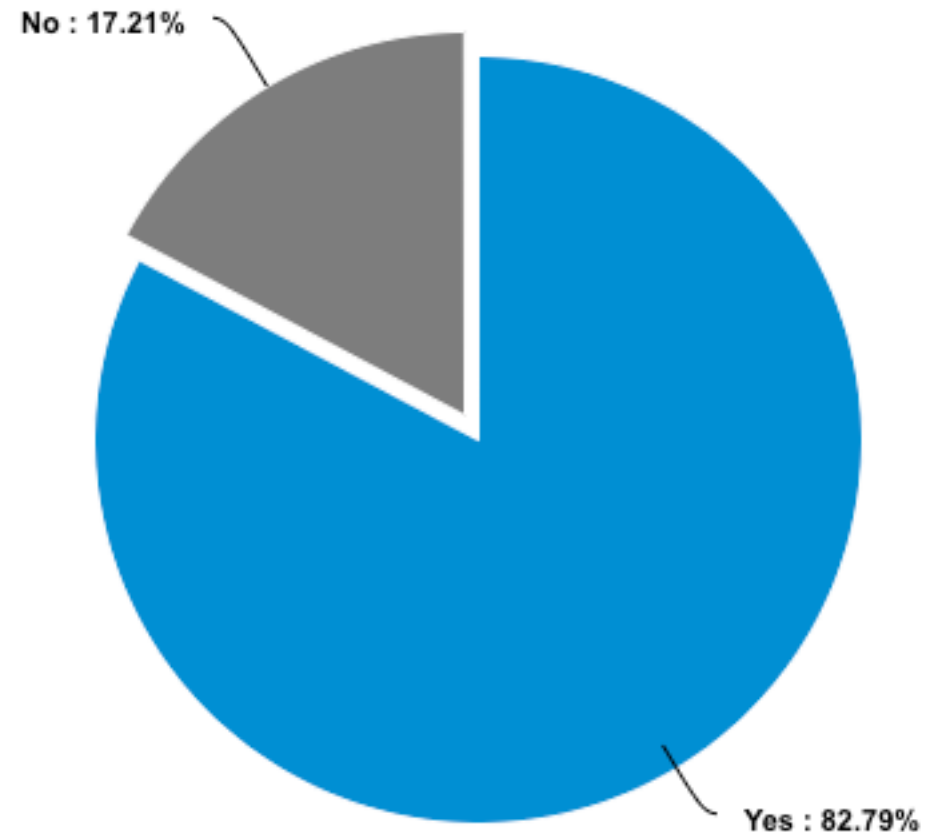


## How many trips by walking?



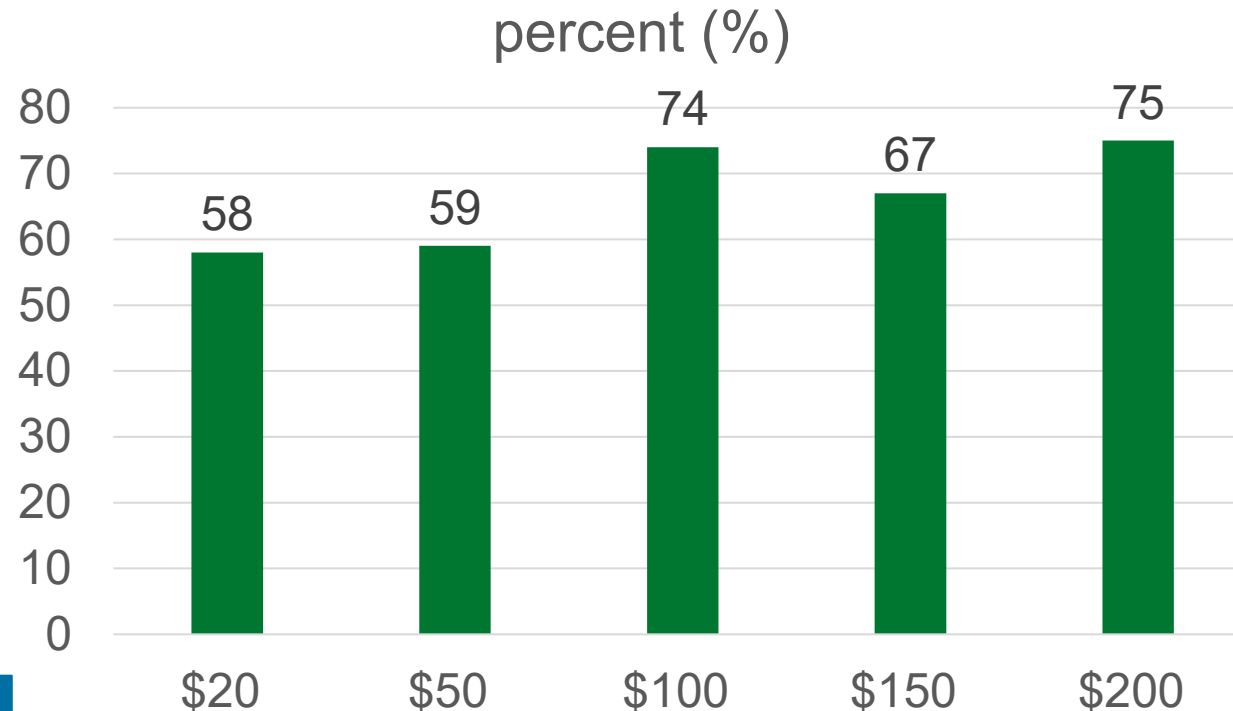
# Visitors: Shuttle Considerations

If you were able to rent a car from your hotel or nearby within walking distance, would you consider taking a shuttle from the airport and renting a car for only the portion of your visit when you planned to travel?



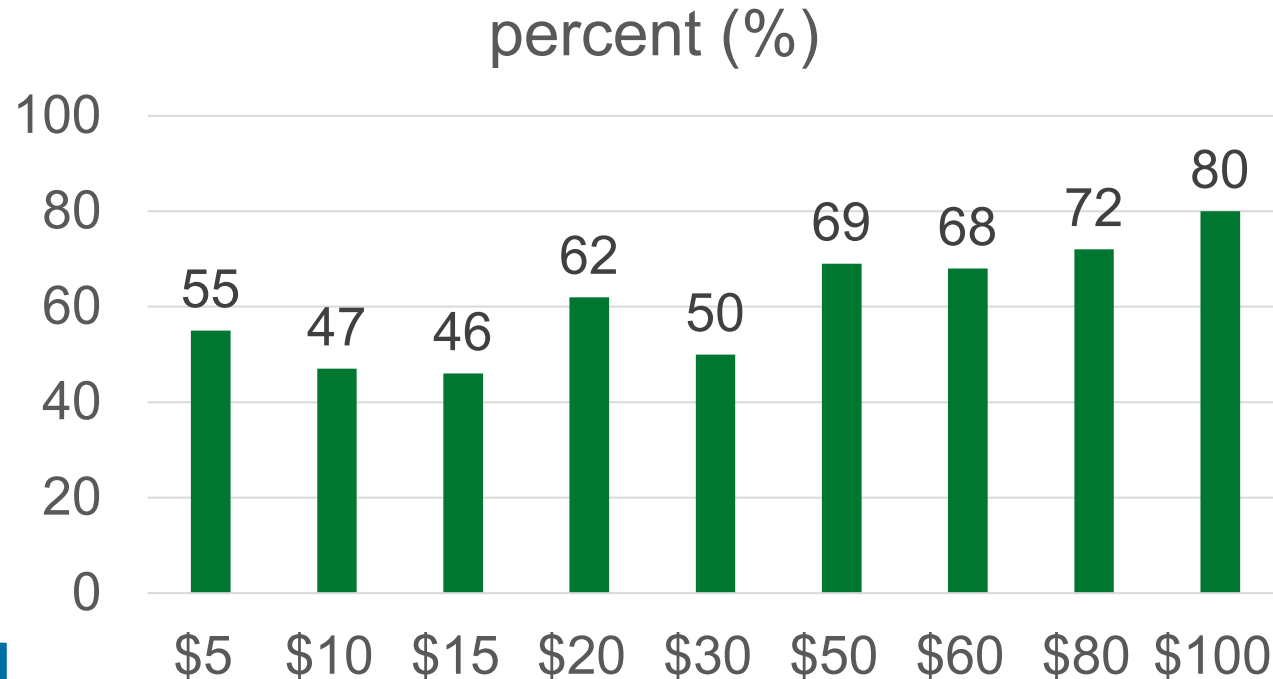
# Visitors: Discount Considerations

If you could get a \$XX discount on your hotel room each night for not renting a car, would you consider foregoing a rental car and using the public transit system while visiting the island?



# Visitors: Parking Fee Considerations

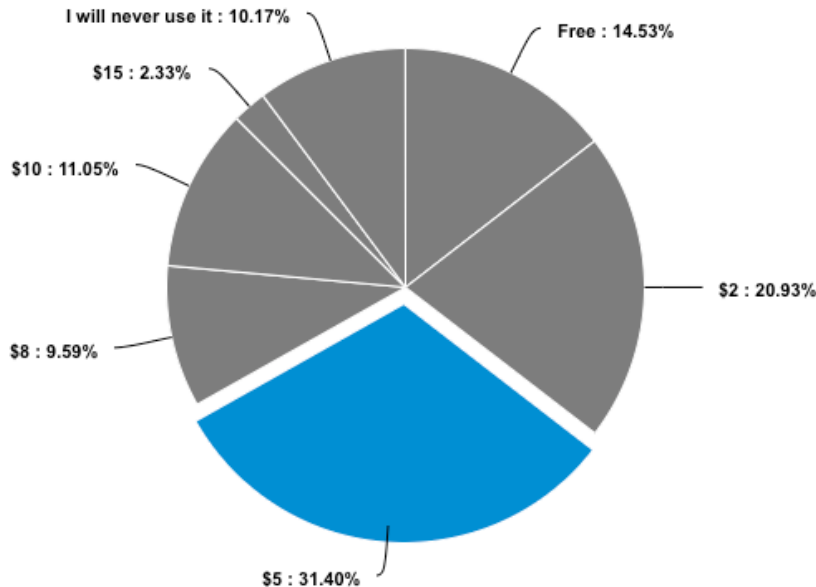
Imagine in the future the travel demand increases on the island and you have to pay a \$XX parking fee at your destination, would you consider using alternative modes for this trip?



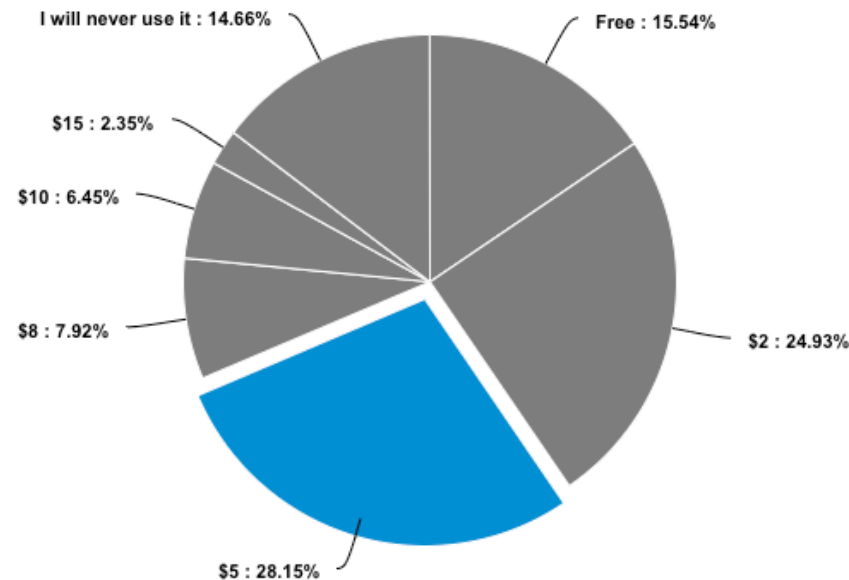
# Visitors: Alternative Transportation Options

Imagine during your stay on Kauai, there was a location 2 miles away from your hotel that you hoped to visit and parking there cost \$5. Besides driving, if there were the following new transportation services to choose from, what is the highest price you would pay to use these new services?

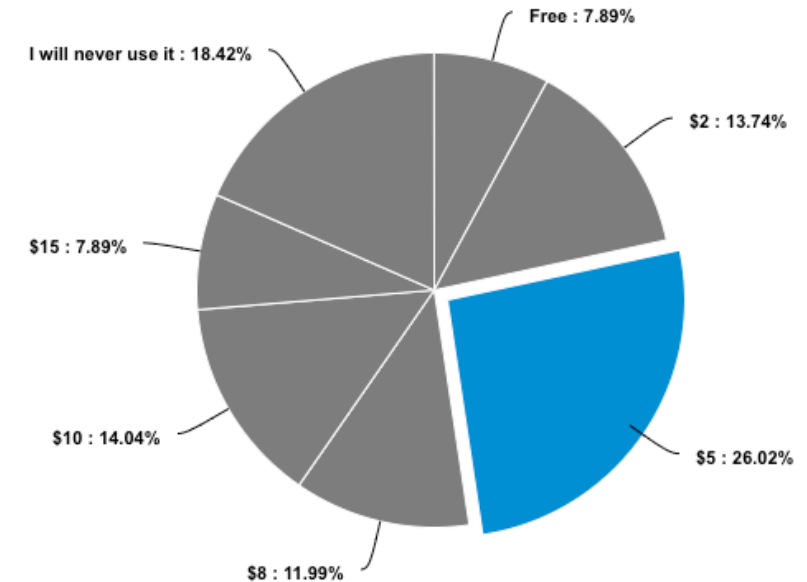
## AV Shuttle



## Bike/E-bike Share

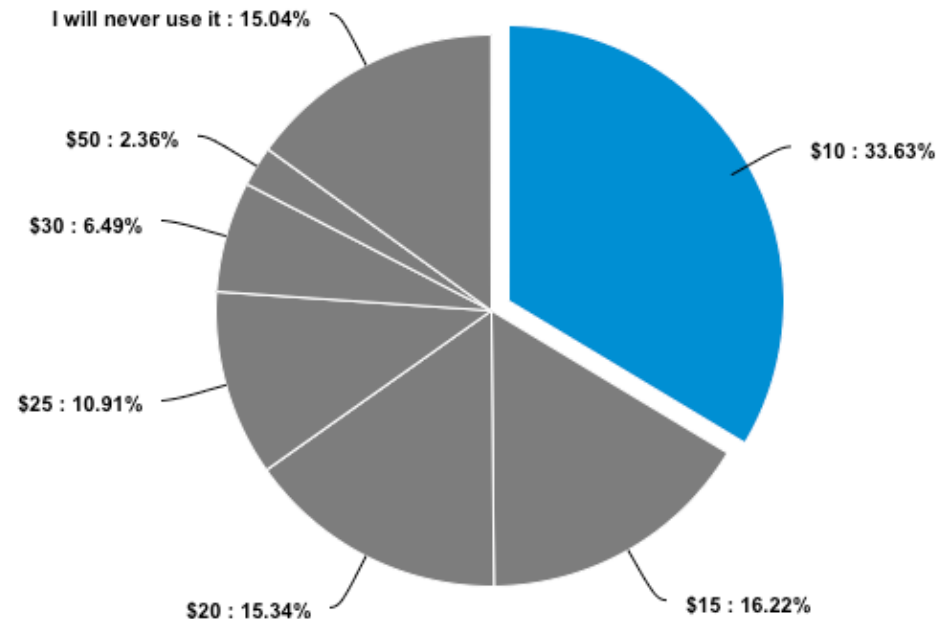


## Car Share



# Visitors: AV Shuttle Cost Considerations

Imagine during your stay on Kauai, there was an **AV shuttle service** that could take you from your hotel to a site 20 miles away that you hoped to visit. Parking there would cost you \$20. Besides driving, if there were the following new transportation services to choose from, what is the highest price you would pay to use these new services?



# Transportation Preference Survey

## Take-aways

- Drive alone and carpool are the choices for the majority of residents for commuting, leisure, or shopping activities (85%–90%).
- Sociodemographic and housing characteristics are the major contributors to mode-choice decisions instead of travel time and cost, indicating the current transit system is not robust enough to compete with driving and it is often only considered when driving is not an option.
- Mobility options such as car share, bike/e-bike share, and AV shuttle have potential to replace driving trips for both residents and visitors.
- 74% of visitors rent a car, among which, more than 50% researched alternative transportation options.
- Only half of those that rented a car drove the car every day. More than 80% of visitor respondents indicated they would consider taking a shuttle from the airport to the hotel and only renting a car for the portion of the visit when a car is needed if it is convenient to do so.
- Offering discounts on lodging has potential to encourage transit use among visitors.



A photograph of a yellow industrial structure, possibly a geothermal wellhead, on a boat in the ocean. The background features a range of mountains under a cloudy sky with a bright sun breaking through the clouds, creating a lens flare effect. The text 'Thank You' is overlaid on the image in a large, bold, black font.

# Thank You

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# Appendix

# ETIPP Kauai: Transportation Preference Survey Questionnaire

## Kauai Residents Ground Transportation Survey 2022: Part 1—General Information

1. **How would you rate the traffic on Kauai?**
  - a) Not congested at all
  - b) A little congested
  - c) Very congested
  - d) Extremely congested
  - e) n/a or I don't know.
2. **Where do you live?**
  - a) Anahola
  - b) Eleele
  - c) Haena
  - d) Hanalei
  - e) Hanamaulu
  - f) Hanapepe
  - g) Lawai
  - h) Lihue
  - i) Kalaheo
  - j) Kalihiwai
  - k) Kapaa
  - l) Kaumakani
  - m) Kealia
  - n) Kekaha
  - o) Koloa
  - p) Kilauea
  - q) Mana (PMRF)
  - r) Moloaa
  - s) Omao
  - t) Pakala Village
  - u) Poipu
  - v) Princeville
  - w) Puhī
  - x) Wailua
  - y) Wailua Homesteads
  - z) Waimea
  - aa) Wainiha
  - bb) Other: \_\_\_\_\_
  - cc) Prefer not to answer.
3. **Where is your primary job?**
  - a) Anahola
  - b) Eleele
  - c) Haena
  - d) Hanalei
  - e) Hanamaulu
  - f) Hanapepe
  - g) Lawai
  - h) Lihue
  - i) Kalaheo
  - j) Kalihiwai
  - k) Kapaa
  - l) Kaumakani
  - m) Kealia
  - n) Kekaha
  - o) Kilauea
  - p) Koloa
  - q) Mana (PMRF)
  - r) Moloaa
  - s) Omao
  - t) Pakala Village
  - u) Poipu
  - v) Princeville
  - w) Puhī
  - x) Wailua
  - y) Wailua Homesteads
  - z) Waimea
  - aa) Wainiha
  - bb) Work from home
  - cc) Other: \_\_\_\_\_
  - dd) Prefer not to answer.
4. **What gender do you identify with?**
  - a) Male
  - b) Female
  - c) Nonbinary
  - d) Transgender
  - e) Gender nonconforming
  - f) Other: \_\_\_\_\_
  - g) Prefer not to answer.
5. **What is your age?**
  - a) 15 or below
  - b) 16 – 24
  - c) 25 – 34
  - d) 35 – 44
  - e) 45 – 54
  - f) 55 - 64
  - g) 65 – 74
  - h) 75 or above
  - i) Prefer not to answer.
6. **Do you have an active driver's license?**
  - a) No
  - b) Yes
  - c) Prefer not to answer.
7. **Do you currently have a bus pass to ride the Kauai Bus?**
  - a) No
  - b) Yes, a monthly pass
  - c) Yes, an annual pass
  - d) As a Kauai Community College student, my student ID is a bus pass
  - e) Prefer not to answer.
8. **What is your current housing type?**
  - a) Single-family home
  - b) Condo
  - c) Townhome
  - d) Apartment
  - e) Duplex
  - f) Renting a room
  - g) Ohana unit
  - h) Boat, RV, van, yurt, etc.
  - i) Other: \_\_\_\_\_
  - j) Prefer not to answer.
9. **What parking options do you have available for parking at home?**
  - a) Personal garage
  - b) Driveway/carport
  - c) On-street
  - d) Parking garage (private)
  - e) Parking garage (public)
  - f) Parking lot (reserved space)
  - g) Parking lot (no reserved space)
  - h) Yard/field.
10. **Do you own or rent your home?**
  - a) Own
  - b) Rent
  - c) Other: \_\_\_\_\_
  - d) Prefer not to answer.
11. **If you are interested in being included in a \$200 prize draw, please provide your email address \_\_\_\_\_ (Optional).**

# ETIPP Kauai: Transportation Preference Survey Questionnaire

## Kauai Residents Ground Transportation Survey 2022: Part 2—General Information

Please provide the following information about your typical commute [shopping/leisure] trip.

- Starting time \_\_\_\_\_
- Distance (estimated in miles) \_\_\_\_\_
- Origin
  1. Anahola
  2. Eleele
  3. Haena
  4. Hanalei
  5. Hanamaulu
  6. Hanapepe
  7. Lawai
  8. Lihue
  9. Kalaheo
  10. Kalihiwai
  11. Kapaa
  12. Kaumakani
  13. Kealia
  14. Kekaha
  15. Koloa
  16. Kilauea
  17. Mana (PMRF)
  18. Moloaa
  19. Omao
  20. Pakala Village
  21. Poipu
  22. Princeville
  23. Puhi
  24. Wailua
  25. Wailua Homesteads
  26. Waimea
  27. Wainiha
  28. Other: \_\_\_\_\_
  29. Prefer not to answer

For this trip, imagine if there were the following new transportation services to choose from and the door-to-door travel time were about the same as your original mode, what is the highest price you would pay to use these new services to replace your original mode?

New Transportation Services	Cost
Bike/e-Bike Share	a. Free b. \$1 c. \$3 d. \$5 e. \$8 f. I will never use it.
Car Share	a. Free b. \$2 c. \$5 d. \$10 e. \$15 f. \$20 g. \$25 h. \$30 i. I will never use it.
AV Shuttle (Autonomous motor vehicle shuttles are driverless electric vehicles with capacity for six to 12 passengers)	a. Free b. \$2 c. \$5 d. \$10 e. \$15 f. \$20 g. \$25 h. \$30 i. I will never use it.

If you drove or rode in a private motor vehicle for most of your trips during this reported day, why did you choose this mode of transportation instead of using an alternative mode of transportation (bus, shuttle, bike, etc.)? (Check all that apply)

1. I had multiple trips I needed to take that day and a car was most efficient.
2. There is not a bus/shuttle stop or share station near my home.
3. I feel unsafe to take the bus/bike/walk.
4. Lack of alternatives.
5. A motor vehicle is the best choice because the trip is long.
6. I needed to transport multiple people and car was convenient.
7. I did not drive in a private motor vehicle for any trips that day.
8. Other: \_\_\_\_\_.

If you drove in a private motor vehicle for most of your trips during this reported day, what would get you out of a car and use an alternative mode of transportation? (Check all that apply)

1. Alternative mode is cheaper or comparably priced to driving.
2. Alternative mode is near my home and near destination.
3. Alternative mode is faster or travel time roughly the same to driving.
4. There are designated lanes and pathways for alternative mode.
5. My alternative mode is better for the environment.
6. I enjoy driving my car no matter what.

# ETIPP Kauai: Transportation Preference Survey Questionnaire

## Kauai Visitors Ground Transportation Survey 2022: Part 1—Travel Characteristics

**Q0. How would you rate your experience with traffic on Kauai?**

1. Not congested at all
2. A little congested
3. Very congested
4. Extremely congested
5. n/a or I don't know.

**Q1. Your most recent visit to Kauai was primarily for:**

1. Business
2. Leisure (vacation, wedding, anniversary, etc.)
3. Visiting family/friends
4. Other: \_\_\_\_\_.

**Q2. How long did you stay on the island during your most recent trip?**

1. 1–2 days
2. 3–5 days
3. 6–10 days
4. 11 days–1 month
5. More than a month.

**Q3. How many times have you visited Kauai in the past decade?**

1. Once
2. Twice
3. 3–5 times
4. 6–10 times
5. More than 10 times.

**Q4. Where did you stay on the island?  
(mark all that apply)**

- Anahola
- Eleele
- Haena
- Hanalei
- Hanamaulu
- Hanapepe
- Lawai
- Lihue
- Kalaheo
- Kalihiwai
- Kapaa
- Kaumakani
- Kealia
- Kekaha
- Kilauea
- Koloa
- Mana (PMRF)
- Moloaa
- Omao
- Pakala Village
- Poipu
- Princeville
- Puhī
- Wailua
- Wailua Homesteads
- Waimea
- Wainiha
- Other (e.g., North Shore): \_\_\_\_\_
- Prefer not to answer.

**Q5. What type of lodging did you choose for your most recent trip to Kauai? (mark all that apply)**

- Hotel/resort
- Timeshare
- Camping only
- Vacation rental/AirBnb/VRBO, etc.
- Stayed with family or friend who lives on Kauai
- Other: \_\_\_\_\_.

# ETIPP Kauai: Transportation Preference Survey Questionnaire

## Kauai Visitors Ground Transportation Survey 2022: Part 2—Transportation Choices

**Q6. Did you rent a car while visiting Kauai?**

- If yes, (Q7)

**Q7. Why did you choose to rent a car? (Please check all that apply)**

- Flexibility of going to more locations during the day
- Cost of alternatives
- Luggage or passenger group size
- Lack of alternatives
- Travel distances
- Personal preference
- Other: \_\_\_\_\_.

**Q8. Did you research other transportation options before renting your car?**

- If no,
  - Why not? Limited time
  - Didn't know there were other options
  - Other options were inconvenient
  - Other options were too expensive.
- If yes,
  - What other options did you research? (Please check all that apply)
  - Bus
  - Shuttle
  - Ride-hail/Taxi
  - Turo
  - Craigslist/Angie's List
  - Bikeshare or e-bike rental.

**Q9. For how many days did you drive your rental car during your visit?**

- Every day
- Most of the days
- About half of the days
- Less than half of the days
- Only for trips to/from the airport.

**Q10. Please fill in the bubble that best describes how often you used each mode. (Q11)**

	Never	Some trips	About half of trips	Most trips	Every trip
Rental car					
Bus					
Shuttle					
Ride-hail/taxi					
Turo					
Bike					
Walk					
Other____					

# ETIPP Kauai: Transportation Preference Survey Questionnaire

## Kauai Visitors Ground Transportation Survey 2022: Part 2—Transportation Choices

**Q12. If you got a \$XX [present different people with different options] discount on your hotel room each night for not renting a car, would you consider foregoing a rental car and using the public transit system while visiting the island? (Yes/No) (Lower priority) [20, 50, 100, 150, 200]**

**Q13. If you were able to rent a car from your hotel or nearby within walking distance, would you consider taking a shuttle from the airport and renting a car for only the portion of your visit when you planned to travel? (Yes/No)**

**Q14. Imagine in the future the travel demand increases on the island and you have to pay a \$XX [present different people with different options] parking fee at your destination, would you consider using alternative modes for this trip? (Yes/No) (Lower priority) (Q18) [5, 10, 15,20,30,50, 60, 80, 100]**

If no to Q6, (Q15)

**Q15. Why didn't you rent a car? (check all that apply)**

- Cost considerations
- Lack of rental car availability
- Environmental impact
- Personal preference
- No need to travel a lot
- I have a car to use (borrowed a friend's/family's car)
- I do not drive/I cannot drive in the United States
- Other: \_\_\_\_\_.

**Q16. What modes of transportation did you use on the island to get around? (check all that apply)**

- Shuttle
- Bus
- Turo
- Bike
- Walk
- Scooter
- Ride-hailing (e.g., Uber, Lyft, etc.)
- Taxi
- Rode in someone else's car as a passenger
- Did not travel
- Other: \_\_\_\_\_.

**Q17. Is there somewhere on the island you wanted to visit but did not because you were unable or did not know how to get there without a car? If yes, please write in the name of the place. \_\_\_\_\_ [write in]**

# ETIPP Kauai: Transportation Preference Survey Questionnaire

## Kauai Visitors Ground Transportation Survey 2022: Part 2—Transportation Choices

**Q18. Imagine during your stay on Kauai, there was a location 2 miles away from your hotel that you hoped to visit and parking there cost \$X(randomized parking cost values). Besides driving, if there were the following new transportation services to choose from, what is the highest price you would pay to use these new services?**

Scenario: Travel to a location 2 miles away with a parking fee of \$5	
New Transportation Services	Cost
AV Shuttle (Autonomous shuttles are driverless electric vehicles with capacity for six to 12 passengers)	a. Free b. \$2 c. \$5 d. I will never use it.
Bike/e-Bike Share	a. Free b. \$1 c. \$3 d. \$5 e. I will never use it.
Car Share	a. Free b. \$2 c. \$5 d. \$10 e. \$15 f. I will never use it.

**Q19. Imagine during your stay on Kauai, there was an AV shuttle service that could take you from your hotel to a site 20 miles away that you hoped to visit. Parking there would cost you \$X (randomized parking cost values). Besides driving, if there were the following new transportation services to choose from, what is the highest price you would pay to use these new services?**

Scenario: Travel to a location 20 miles away with a parking fee of \$20	
New Transportation Services	Cost
AV Shuttle (Autonomous shuttles are driverless electric vehicles with capacity for six to 12 passengers)	a. \$10 b. \$15 c. \$20 d. \$25 e. \$30 f. I will never use it.
	a. \$10 b. \$15 c. \$20 d. \$25 e. \$30 f. I will never use it.

**Q20. If you are interested in being included in a \$200 prize draw, please provide your email address \_\_\_\_\_ (Optional).**