Car or Bike?

A DCP/DOT report to better understand why NYC commuters shift from cars to bikes and how to encourage them to do so
Executive Summary

**Purpose of the study:** To understand why people shift modes from autos to bikes and to find opportunities for NYC government to encourage mode shift

**Existing cycling data that this report relies on:**
- Department of Health and Mental Hygiene (DOHMH) Community Health Survey
- Census Transportation Planning Package (CTPP)/American Community Survey (ACS)

This report largely relies upon two surveys carried out by DOT and DCP:

I. **Commuter Survey, April 2019 (NYC Department of City Planning and Department of Transportation):**
   **Goal:** To gauge the willingness and ability of the commuting public to shift modes from auto to bike for commute trips
   - Respondents who never rode a bike were found least likely to do so for any reason.
   - Respondents who rode once a month said good weather was the primary factor in causing them to ride more.
   - Respondents who rode often said safer streets and infrastructure was the primary factor causing them to ride more.
II. Cyclist survey; Fall, 2019 (NYC DCP and DOT):

*Goal:* To find out what interventions would get existing cyclists to ride more and shift auto trips to bike trips.

- **Summary statistics:**
  - Over half the respondents fell into the 30-49 age group and earned more than $75,000 per year.
  - Over three-quarters of respondents lived near a Citi Bike station, which are all in or close to Manhattan.
  - *Survey respondents are not necessarily representative of the cycling population in New York City as a whole, largely due to challenges in reaching the city’s diverse cycling community.*

- **Survey results:**
  - Respondents said more [protected bike lanes](#) and [safer traffic conditions](#) were prime factors influencing them to ride more.
  - Respondents with lower incomes often cycle because they [do not have access to a car](#) and for [economic reasons](#).
  - Several hundred respondents provided valuable feedback that was not anticipated by the survey. The three most popular unanticipated issues raised were [bike lane blocking](#) and [lack of network connectivity](#) and [bridge access](#).

**Literature review summary:**
Potential methods to induce mode shift that have been explored:

- Promote a mixed-use neighborhoods with shorter commutes
- Expand protected bike infrastructure
- Establish targeted campaigns to increase cycling
- Subsidize cycling as a commute mode
- Expand public transit, which tends to boost cycling
Policy Implications

Implications for City policy:

• A core mission of the Department of City Planning is to promote mixed-use development and ample open space in neighborhoods throughout New York City. The City should continue this approach and evaluate the impact of current zoning on mode choice, including transit.
  • Because transit use has been shown to be correlated with cycling, transit-oriented development can also encourage cycling.
  • Continued investment in robust cycling infrastructure and traffic safety is key.
    • The NYC Department of Transportation has installed 169 lane miles of protected bike infrastructure since 2009 and plans to install up to 280 more in the next 6 years, as the budget allows.
    • Focusing on multi-modal systems with tie-ins to transit may result in the greatest return in mode shift.
  • Cycling encouragement campaigns targeting existing, infrequent cyclists are more likely to succeed than general campaigns or campaigns targeting non-cyclists.
  • The city should explore new ways to increase capacity for affordable and secure indoor bike parking in existing and new residential buildings as well as parking garages.
Community Health Survey 2018: Cycling Data

The Department of Health and Mental Hygiene conducts the Community Health Survey (CHS) every year by phone. Several health-related questions are posed as well as one question about respondents’ cycling behavior.

Survey results for the 2018 data set show:
• Around 20 percent of respondents ride a bike at least a few times a year;
• A significant gender difference exists in cycling habits, with 85 percent of women saying they never ride a bike compared to 69 percent of men.

Survey question: In the past 12 months, how often have you ridden a bicycle in one of the five boroughs of New York City? Would you say once a week or more, several times a month, at least once a month, a few times a year, or never?
There are significant racial differences in cycling habits, with 83 percent of black people saying they never ride a bike compared to 76 and 77 percent of whites and Hispanics.

Cycling frequency is positively correlated with general health, with 11 percent of those in excellent health cycling often.

*Survey question: Would you say that in general your health is: excellent, very good...
Community Health Survey 2018: Cycling Data

While there is no clear overall correlation between cycling habits and mental health score, those who ride once a week or more assess themselves as significantly more mentally healthy than do those who never ride a bike.

*Survey question: Patient Health Questionnaire depression scale – based on last 2 weeks; follows a series of questions about the respondent’s mood. Higher scores indicate worse self-assessed mental health.
Short Commutes by PUMA/Community District

Commutes of 5 to 20 minutes may be more likely to shift to bike because most bike trips are short distances. Census data indicates over 80 percent of NYC bike commute trips are shorter than 5 miles.*

Travel time to work data from the American Community Survey shows that in addition to the Manhattan Core, several community districts in Brooklyn and Queens have high numbers of short commutes, particularly Queens CDs 7, 8 and 12 and Brooklyn CDs 1, 12 and 18.

*Source: 2012-2016 Census Transportation Planning Product
• At the level of neighborhood tabulation areas, several additional areas have high concentrations of short trips including Jackson Heights, South Ozone Park, Flushing and Murray Hill in Queens; and Borough Park in Brooklyn.

• These are potential areas of focus for NYC government to encourage mode shift.

Source: 2014-2018 American Community Survey
Commuter Survey Overview

- **Survey conducted by the NYC Department of City Planning and Department of Transportation in April 2019**

- **Goal:** Gauge the willingness and ability of the commuting public to shift modes from auto to bike for regular commute trips

- **Dates and locations:** Subway station entrances selected based on a combination of factors including socioeconomic and demographic conditions, mode split and proximity to large residential communities:
  - 4/9/19: Flatbush 2/5
  - 4/10/19: Jackson Heights E/F/M/R/7
  - 4/16/19: Canarsie L
  - 4/17/19: Tremont B/D
  - 4/23/19: Flushing 7
  - 4/24/19: Classon G
  - 4/30/19: Jamaica E/J/Z

- **Total Respondents:** 407
Commuter Survey Data Summary

- Most respondents rode either subway or bus
- 2.4 percent or 7 respondents rode bikes as their primary mode. The bike sample size was too small to determine respondents’ reasons for cycling

Mode Split (primary mode)

- Bike: 27%
- Bus: 5%
- Car: 9%
- Subway: 2%
- Taxi, Uber, etc.: 1%
- Walk: 6%

n=407

Why respondents used bike for any portion of their trip

- Environmental concerns: 1
- Exercise OR enjoy cycling: 6
- Faster/more efficient than other modes: 3
- No access to a car: 1
- Other: 1
Commuter Survey Data Summary

- Most respondents were commuting to work or school or to take care of errands when they were interviewed.
- The importance of bike infrastructure increased as respondents reported more cycling.
- 29 percent of those who reported never cycling (105 people) said nothing would get them to ride a bike.

Ride More by Cycling Frequency

Question: Are there any factors that could get you to ride a bike more?
(Check all that apply)

Trip Purpose

- Errands
- other
- Pleasure/free time
- School
- Work

n=604
Commuter Survey and CHS 2018 compared

- Majorities in both surveys said they never ride bikes.
- The Commuter Survey found that 21 percent of respondents ride a bike at least once a month compared to 14 percent for the CHS.
- Please note: the Commuter Survey interviewed people on the street who were actively commuting while the CHS contacted people by phone who may or may not have been regular commuters. This may account for some of the differences in the results.
Commuter Survey Conclusions

General conclusions:

• **Lower-income respondents took the bus more** at the expense of the subway than those in other income brackets.

• Lower-income respondents had shorter commutes than middle-income respondents.

• **Cycling:**
  • People who never ride a bike said they were least likely to increase their cycling frequency for any reason.
  • **People who cycle occasionally said good weather was the factor that would get them to ride more** in the greatest numbers.
  • **People who ride often said safer streets and infrastructure would get them to ride more** in the greatest numbers.
Cyclist Survey

- **Survey conducted by the NYC Department of City Planning and Department of Transportation in Fall, 2019**

- **Goal:** To find out what kinds of interventions would get existing cyclists to ride more and shift auto trips to bike trips.

- **Total respondents:** 3,113 (110 handlebar; 3,003 online)

- **The survey posted online:**
  - QR code on handlebar form
  - URL provided in NYCycles newsletter
  - Streetsblog article promoted survey

- **Handlebar distribution:** The survey team distributed approximately 700 surveys by attaching them to parked bikes in several neighborhoods. Respondents either mailed them in or used the information included to complete the survey online. Distribution locations included:
  - Corona
  - Downtown Brooklyn
  - Eastern Parkway
  - Flushing
  - Fordham University
  - Greenwich Village
  - Jackson Heights
  - Junction Boulevard
  - Mott Haven
  - Mt. Eden
  - St. George
  - Sunset Park
Top reasons for cycling in general were exercise or enjoyment, and the belief that cycling was faster and more efficient than other modes. Environmental and economic concerns were also said to be in important.

Prime motivations respondents cited for potentially cycling more were more protected bike lanes and safer traffic conditions.

Lower-income respondents said in greater numbers that they cycle because they do not have access to a car and for economic reasons.

Frequent cyclists cited economic concerns and efficiency as most important in why they ride; and were most concerned with bike lanes and safer traffic condition in terms of riding more.

Bike share users placed more emphasis on speed and efficiency than cyclists who ride their own bikes.

Respondents also provided valuable feedback in text-based responses.
- Conditions that could be improved included bike lane blocking, network connectivity and bridge access.

*Survey respondents are not necessarily representative of the cycling population in New York City as a whole, largely due to challenges in reaching the city’s diverse cycling community.
Areas with a high number of residents, whose primary mode to work is cycling, were also the areas with the most requests for improvements.
Studies over the past twenty years have shown that there are several potential methods to influence commuters to shift from autos to bikes:

- **Promote a mixed-land-use urban environment** that features residential and recreational land uses in close proximity with widespread street furniture. (Ton 2018; study done in the Netherlands)

- **Expand the bike path network.** This could be especially influential with those who do not cycle at all because they are most concerned with safety. (Rowangould et al 2016; study done in Albuquerque, New Mexico)

- However, Song 2017 indicates that installation of bike infrastructure may only be effective at increasing ridership among those who already cycle. This study showed that mere proximity to new infrastructure did not increase active mode share. (Song et al 2017; study done in England)

- **Cycling programs targeted at motivated groups can be effective** at increasing cycling, but publicity campaigns are often not. (Ogilvie 2004; assessed several studies in the U.S., Europe and Australia)
  - Denmark’s Bikebusters and Australia’s Travel Blending programs worked with groups who expressed desire to shift modes and had success in facilitating it with support such as travel subsidies and feedback.

- **Commuter subsidies and the building of new train stations can increase active mode share.** Increased transit mode share often goes together with increased active mode share. (Ogilvie 2004; Ton 2018)
Conclusions

• **Literature Review Conclusions:**
  - Promote a mixed-use environment
  - Expand protected bike infrastructure
  - Establish targeted campaigns to increase cycling
  - Subsidize cycling as a commute mode
  - Expand public transit, which tends to boost cycling

• **Survey Conclusions:** Largely confirm existing knowledge about mode shift motivations and preferences.
  - Those who do not ride a bike at all are least likely to shift modes from auto to bike for any reason.
  - Existing cyclists are most likely to increase their cycling frequency and to mode shift if:
    - Protected bike lane mileage is increased
    - Traffic conditions are made safer
    - More bike parking is available
Appendix
Cyclist Survey: Where respondents live

- 3,021 responses from NYC residents
- 78 percent from Manhattan and Brooklyn
• Respondents largely fell in the age range of 30 to 49 and earned over $75,000 per year.
• As the previous slide shows, respondents’ home addresses were largely concentrated in the inner ring around Manhattan.
• Given the diverse ways different age, income and geographic groups answered survey questions, the results do not necessarily provide a representative cross section of the NYC cycling public. As the income chart above shows, the survey may have over-sampled cyclists at the higher end of the income spectrum. While the survey team made every effort to arrive at an equitable survey sample by, for example, distributing the handlebar survey at several locations throughout the city, there remain significant challenges to reaching this diverse population of cyclists.
Cyclist Survey: Why do you ride a bike?

**Top two responses:**
- Exercise OR enjoy cycling
- Faster/more efficient than other modes

**Ranking Score:** Respondents ranked each response from 1 to 5 in order of importance. In these charts, the higher the score, the more important the item was considered by respondents. There is only one answer per respondent.

**Total Responses:** The total number of people who ranked this question. Respondents could choose multiple responses.
Cyclist Survey: What factors would get you to ride a bike more?

**Top two responses:**

- More protected bike lanes
- Safer traffic conditions
Cyclist Survey: For these trips, what factors would get you to ride a bike instead?

Respondents were asked what would get them to ride a bike instead of driving a car for a typical trip.

**Top two responses:**

- More protected bike lanes
- Safer traffic conditions
Cyclist Survey: Why people ride by income

- All income groups generally had the same reasons for cycling.

- **Exercise OR enjoy cycling** and **Faster/more efficient than other modes** were more important for higher-income groups.

- **No access to a car** was more important for lower-income groups.

- **Economical** was less important for higher-income groups and students.

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**Weighted Score for "Why Ride" Reasons by Income Groups**

- Exercise or enjoy cycling
- Environmental concerns
- No access to a car
- Economical
- Faster/more efficient than other modes
- There is good bike infrastructure
- Work requirements
- Other

- **Student**
- **Less than $50,000 per year**
- **$50,000 to $75,000 per year**
- **More than $75,000 per year**

- n=2,619
Cyclist Survey: Why people ride by cycling frequency

- As cycling frequency increased, respondents considered **Economical** and **Faster/more efficient than other modes** to be more important.

- Cycling frequency is somewhat correlated with **Environmental concerns**.

![Weighted Score for "Why Ride" Reasons by Biking Frequency Groups](image-url)

- Less than once a month
- About once a month
- 1-3 times per week
- More than 3 times per week

n=2,711
Cyclist Survey: Why people ride by bike type

• Both bike types generally had the same reasons for cycling, but
  • **Faster/more efficient than other modes** was more important to bike share users and
  • **Exercise/enjoy cycling** was more important to personal bike users.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Personal Bike</th>
<th>Bike Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise or enjoy cycling</td>
<td>3.88</td>
<td>3.4</td>
</tr>
<tr>
<td>Environmental concerns</td>
<td>2.07</td>
<td>1.82</td>
</tr>
<tr>
<td>No access to a car</td>
<td>0.58</td>
<td>0.63</td>
</tr>
<tr>
<td>Economical</td>
<td>1.92</td>
<td>1.87</td>
</tr>
<tr>
<td>Faster/more efficient than</td>
<td>3.49</td>
<td>3.98</td>
</tr>
<tr>
<td>other modes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is good bike infrastructure</td>
<td>0.35</td>
<td>0.56</td>
</tr>
<tr>
<td>Work requirements</td>
<td>0.07</td>
<td>0.05</td>
</tr>
<tr>
<td>Other</td>
<td>0.13</td>
<td>0.08</td>
</tr>
</tbody>
</table>

n=2,826
Cyclist Survey: Respondents’ age distribution

Age Distribution (Excluding Invalid Inputs)
Cyclist Survey: Why people ride by age

- Several factors show correlation with age, with the “under 23” group as an exception.

- Exercise OR enjoy cycling was cited as increasingly important as age increases.

- Environmental concerns, No access to a car, Economical and Faster/more efficient than other modes generally became less important with increasing age.

![Weighted Score for "Why Ride" Reasons by Age Groups](chart.png)
Cyclist Survey: Impetus to ride more by cycling frequency

- Generally, those who cycle more frequently said they would ride more if there were **more standard bike lanes** and **safer traffic conditions**.

- People who cycle less than once a month attached less significance to bike lanes than did those who cycled more frequently.

**Weighted Score for "Ride More" Improvement by Biking Frequency Groups**

- **More protected bike lanes**: 4.13 for more than 3 times per week, 1.18 for less than once a month.
- **More standard bike lanes**: 0.81 for less than once a month, 1.39 for about once a month.
- **More bike parking**: 1.06 for 1-3 times per week, 1.37 for more than 3 times per week.
- **Better wayfinding**: 0.39 for about once a month, 0.44 for 1-3 times per week.
- **Access to bike share**: 0.56 for 1-3 times per week, 0.73 for more than 3 times per week.
- **Safer traffic conditions**: 3.48 for about once a month, 3.83 for 1-3 times per week.
- **Other**: 0.68 for more than 3 times per week, 0.43 for 1-3 times per week, 0.47 for about once a month, 0.58 for less than once a month.

*Figure: Weighted Score for "Ride More" Improvement by Biking Frequency Groups (n=2,801)*
Cyclist Survey: Impetus to ride more by bike type

- Safer traffic conditions was cited as more important for cyclists who ride their own bikes compared to those who use bike share.
Cyclist Survey: Impetus to ride more by age

- Generally, respondents saw more bike lanes as less of an impetus to ride more as age increased.

- The 30-49 age group said safer traffic conditions was an important factor in cycling more compared with other age groups.
Cyclist Survey: Mode shift factors by income

- Students cited more bike lanes and **Safer traffic conditions** as more important to shifting modes than other age groups.
Cyclist Survey: Neighborhood Improvement Areas

Neighborhoods where respondents believe increased bike infrastructure could increase cycling.

Top Ten Neighborhood Improvement Areas by PUMA/CD

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Improvement Areas by PUMA/CD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MN 4&amp;5</td>
<td>298</td>
</tr>
<tr>
<td>BK 2</td>
<td>261</td>
</tr>
<tr>
<td>BK 1</td>
<td>190</td>
</tr>
<tr>
<td>MN 1&amp;2</td>
<td>185</td>
</tr>
<tr>
<td>BK 6</td>
<td>177</td>
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<tr>
<td>QN 2</td>
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<td>BK 3</td>
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<td>MN 3</td>
<td>125</td>
</tr>
<tr>
<td>MN 6</td>
<td>118</td>
</tr>
<tr>
<td>BK 7</td>
<td>117</td>
</tr>
</tbody>
</table>

Neighborhood Improvement Areas by PUMA/CD

Neighborhood Improvement Responses

- 4 - 20
- 21 - 60
- 61 - 125
- 126 - 190
- 191 - 298
NYC DOT identified Ten Priority Bicycle Districts where cyclist KSI is relatively high, but bicycle facilities are comparatively sparse.

Some of these districts correspond with improvement areas listed by respondents in the survey. The survey’s data on improvement areas may complement DOT’s metric for identifying Priority Bicycle Districts.
Trip Distance: Cyclist Survey

- Respondents were asked about their flexibility in shifting from auto to bike for certain trips or portions of trips. They were also asked the distance of the potential mode-shifted bike portion of such trips.*

- These answers provide insight into how far respondents are willing to cycle instead of drive if conditions are right.

- The plot of these responses shows that the **average trip length** for the potential bike portion of these trips is **6 miles**. Factoring in the standard deviation, most of these potential bike trips would range from 1.2 **miles** to 10.7 **miles**.

*Please see questions 6 through 9 on page 47 for exact phrasing.
Cyclist Survey: “Other” text-based responses

The three ranking questions and the neighborhood improvements question contained text-based “Other” responses. Those were combined and classified according to the categories on this chart. They provide an indication of sentiment among cyclists for improving cycling conditions that was not anticipated by survey questions.
Cyclist Survey: “Miscellaneous” text-based responses
Cyclist Survey “Miscellaneous” text-based responses

San Francisco MTA

NJ Transit

Cycle highway, Netherlands

Shower Pod

Repair station, Boston

Water bike
Cyclist Survey: Responses Inside/Outside Citi Bike Catchment Area

Where Respondents Live

Zip Codes Based on Citi Bike Catchment

- 73 percent of respondents were located in “NYC Inside Citi Bike Catchment”
- 22 percent of respondents were located in “NYC Outside Citi Bike Catchment”
Cyclist Survey: Outside Citi Bike Catchment Area

Where respondents live

Survey Responses by PUMA/CD

- 2 - 10
- 11 - 20
- 21 - 70
- 71 - 150
- 151 - 340

Citi Bike Catchment Area
PUMAs Inside Citi Bike Catchment

Improvement requests for those who live outside Citi Bike catchment area

Neighborhood Improvement Areas by PUMA/CD

- 2 - 8
- 9 - 14
- 15 - 23
- 24 - 38
- 39 - 52

Citi Bike Catchment Area

- Survey respondents were highly concentrated within the Citi Bike catchment area.
- Respondents who reside Outside Citi Bike catchment area emphasized neighborhood improvements in areas that differed from the larger sample.
Cyclist Survey: Income inside/outside catchment area

Would you be willing to share your personal income to give us background on who tends to ride bikes?

Respondents who lived inside the Citi Bike catchment area tended to have higher incomes than those who lived outside.
Cyclist Survey: Summary Statistics

How often do you ride a bike?

- Less than once a month: 133
- About once a month: 164
- 1-3 times per week: 777
- More than 3 times per week: 2,013

What is your gender?

- Female: 785
- Male: 2,062
- Prefer to self-describe: 53
Cyclist Survey: Summary Statistics

- **What is your home zip code? (or neighborhood name)**
  - Bronx: 96
  - Brooklyn: 1,419
  - Manhattan: 1,005
  - Queens: 400
  - Staten Island: 47
  - xNew Jersey: 44
  - xOther: 102

- **Do you own a car?**
  - No: 1,888
  - Yes: 1,020


Car or Bike?

PLANNING

Handlebar Survey Form

The individual results of this survey are 100% ANONYMOUS and CONFIDENTIAL. No names or any other private information will be collected. The purpose of this survey is to increase knowledge and understanding of bicycle use in New York City. The results of this survey are being used to make your community better for cycling. This survey is being conducted by the Department of City Planning. For more information, please contact Bikesurvey@planning.ny.gov.

1. What is your home zip code? (or neighborhood name)

2. How often do you ride a bike? (Circle one)
   - Less than once a month
   - About once a month
   - 1-3 times per week
   - More than 3 times per week

3. What kind of bike do you use for most of your trips? (Circle one)
   - Personal bike
   - Citi Bike
   - Other bike share

4. Why do you ride a bike? (Rank 1 to 5)
   - Exercise OR enjoy cycling
   - Environmental concerns
   - Safe/better pedestrian experiences
   - Economic
   - Faster/more efficient than other modes
   - More bike friendly infrastructure
   - Work requirements
   - Other

5. What factors would get you to ride a bike more? (Rank 1 to 5)
   - More protected bike lanes
   - More standard bike lanes
   - More bike parking
   - Better wayfinding
   - Access to bike share
   - Safer traffic conditions
   - Other

For questions 6, 7 and 8, choose a maximum of five choices and rank them on a scale of 1 to 5, with 1 being most important and 5 being least important.

6. ¿Cómo maneja Ud. en bicicleta en su ciudad? (Encuesta sobre ciclistas)
   - Menos de una vez al mes
   - Una vez al mes
   - 1-3 veces por semana
   - Más de 3 veces por semana

7. ¿Cuál variedad de bicicleta usa Ud. para las visitas a la ciudad? (Encuesta sobre bicicletas)
   - Bicicleta personal
   - Citi Bike
   - Otra bicicleta compartida

For the questions 8, 9, and 10, please mark your choices in the 1-5 scale.

8. ¿Cuál es su uso de bicicleta?
6. Are there trips for which you commute by car (personal or other) instead of bike for all or part of the trip, but would rather use bike?  
   Yes  
   No  
   [Option to question 10]

7. If yes, for these trips, what factors would you get to commute by bike instead? (Bank to 5)  
   More protected bike lanes  
   More standard bike lanes  
   More bike parking  
   Better wayfinding  
   Access to bike share  
   Safer traffic conditions  
   Not carrying cargo OR travelling alone  
   Other: ________________________________

8. What would be the distance of the bike portion of this typical trip?  
   ____ miles

9. What is the distance of the entire trip?  
   ____ miles

10. Are there any neighborhoods (including your own) where you believe increased bike infrastructure—including bike lanes, bike share, etc.—could increase cycling? Please list up to 5 by zip code or neighborhood name:  

11. What is your gender?  
   Female  
   Male  
   Prefer to self-describe  

12. What is your age?  
   ____

13. Would you be willing to share your personal income to give us background on who tends to ride bikes? (Circle one)  
   Less than $50,000 per year  
   $50,000 to $75,000 per year  
   More than $75,000 per year  
   Student  

14. Do you own a car?  
   Yes  
   No  

Thank you for your time!