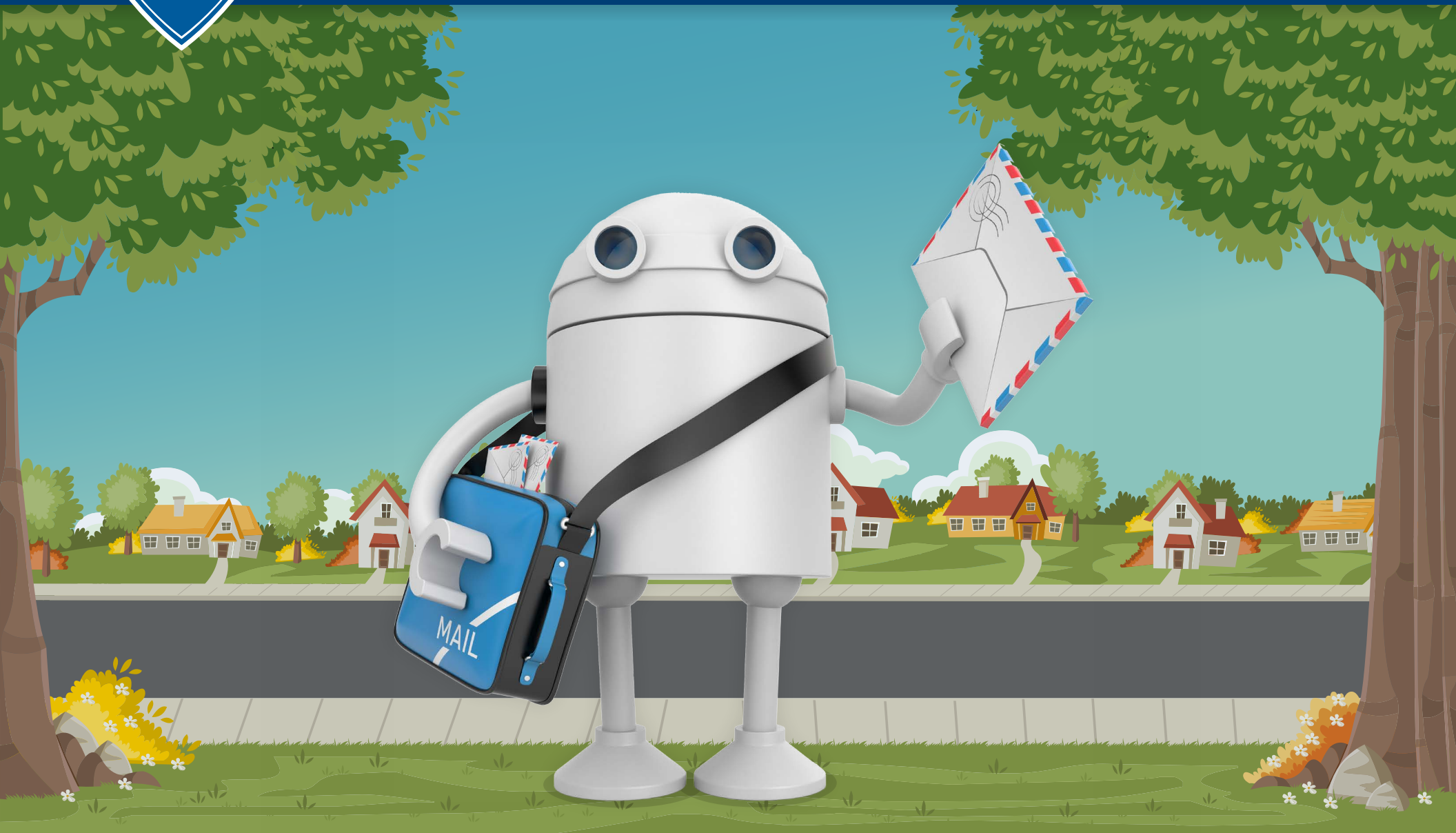
Office of Inspector General | United States Postal Service

RARC Report

# Detailed Subgroup Findings Report: Generations and Rurality Public Perception of Delivery Robots in the United States

Report Number RARC-WP-18-005-A | April 9, 2018



# HOW TO READ THIS REPORT

The U.S. Postal Service Office of Inspector General's (OIG) public opinion research projects are different from other OIG products in that they are designed to be useful to a general audience while also meeting the technical disclosure standards required by the field of survey research.

The content of this survey's reporting is divided across three separate products, each of which is available through the OIG's document library.* Each product has been designed to be readable as a stand-alone report:

- Those with interest in national findings on the research topic should focus on the Summary Report.
- Those with interest in in-depth reporting for several relevant subgroups should also review the Detailed Subgroup Findings Report.
- Those interested in the technical details surrounding the collection of the data used for this project should review the Methodology Report.

*The USPS OIG Document Library can be accessed through the web at: https://www.uspsoig.gov/document-library.

Most of the slides in the reporting for this survey are designed so that they can be consumed on their own. This way, if someone takes out one slide and shares it, they can understand the findings presented without needing to see the entire report. For that reason, the footnotes found on each slide include important details that might be different from what a general audience is used to seeing, such as notes about any statistical testing that was performed, or the full text of any question whose results are reported on the slide.

General audience members will be most interested in the findings presented at the top of each page of a report. As you move down any given slide, the information presented gets more detailed and technical.

***Please see Appendix A for additional guidance on interpreting the detailed data visualizations that are presented throughout this report.***

*Note:* Throughout this report, Amazon.com, UPS, and FedEx are used to identify companies about which survey data was collected. Amazon.com is the registered trademark of Amazon.com, Inc. UPS is the registered trademark of United Parcel Service of America, Inc. FedEx is the registered trademark of Federal Express Corporation. These trademarks and their respective logos are used for identification purposes only and their use is not meant to imply in any way that the registered holders of the trademarks sponsor or endorse this report or the services of the U.S. Postal Service.

# METHODOLOGY

The U.S. Postal Service Office of Inspector General (OIG) fielded a confidential online survey targeting a nationally representative sample of 18-75 year-old residents of the 50 United States and the District of Columbia. Respondents were selected from an opt-in Internet panel, solicited by email, and incentivized to complete the survey on the OIG's online survey platform by the sampling services provider SSI, per their standard sampling procedures. The survey was conducted in English and Spanish.

Quota sampling procedures were employed during the survey field period in order to improve the representativeness of the data collected. Quotas were employed on age, gender, nativity within ethnicity, race, education, geographic subregion, and ecommerce participation.

With the exception of ecommerce participation, data were weighted prior to analysis according to U.S. Bureau of the Census population estimates on all quota variables, as well as on income and employment status. Ecommerce participation was weighted to reflect the proportion of Americans that had purchased something online in the previous month*. All data and sample sizes in this research's reports are weighted.

Field Dates: November 13 – December 6, 2017

Total Respondents: 2,942

Median Interview Length: 18 minutes 34 seconds

95% confidence interval (National Sample): +/- 1.8%**

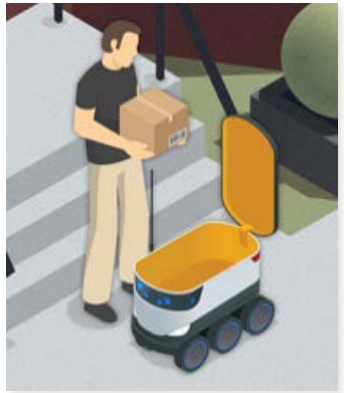
***Please see the Methodology Report for this project for detailed information regarding the methodology employed for this research.***

*Benchmark per the results of a national general population probability telephone survey. | **This interval is being provided as a benchmark. +/- 1.8% is the size of the confidence interval that would be calculated from a probability sample of n=2,942. Like most online research, this study uses a non-probability sample. The actual interval is likely to be somewhat larger, as other sources of error may also impact findings.

# TWO DELIVERY MODELS PRESENTED TO RESPONDENTS

*Model 1:*

## Independent Delivery



In the “Independent Delivery” model, self-guided robots would deliver items on their own, without a carrier accompanying them. The robots would be on wheels, would be about 3 feet tall, and would have a locked compartment where items to be delivered would be secured.

Independent delivery robots would use onboard cameras and sensors to help them safely avoid people and objects as they navigate from the sender of an item to the person receiving it. They would travel on sidewalks at about the same speed as a person walking, using crosswalks when necessary to cross streets. Their cameras, locked compartments, and other design features would also help prevent people from tampering with the robot or its contents as it completed deliveries.

When ordering an item to be delivered by a self-guided robot, the recipient would choose the time when they wanted the item to be delivered, which could be in as little as 15-30 minutes, depending on how far the robot would need to travel and on what kinds of items were being delivered. When placing an order, recipients would also choose the place of delivery — which could be their address, or another location of the recipient’s choice.

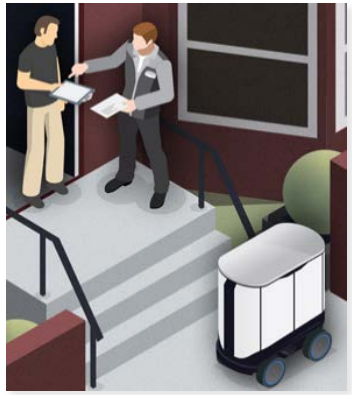
Fifteen to thirty minutes before an item was scheduled to arrive, the recipient would be sent an email, text, or phone app notification to let them know that the robot, with the items to be delivered locked inside, was on its way. Once the robot arrived at the delivery location, it would send another message stating that it was waiting outside and would let the recipient know how many minutes they had to retrieve their item before the robot would return to the sender. That message would also include a 4 digit code that the recipient would use to unlock the robot’s compartment in order to retrieve their item.

After delivery, the robot would use its onboard cameras and sensors to help it safely avoid people and objects as it navigates back to the sender’s location.

# TWO DELIVERY MODELS PRESENTED TO RESPONDENTS

*Model 2:*

## Helper Robots



In the “Helper Robots” model, a delivery person would load their items for delivery into the robot. The self-guided robot would then follow the carrier as they walked between homes and businesses and would help them complete their work. The robots would be on wheels, would be about 4 feet tall, and would have a locked compartment where items for delivery would be secured.

Helper robots would use sensors and cameras to help them stay close to, and travel at about the same speed as, the delivery person that they were helping. The robots would also use their sensors and cameras to help them safely avoid people and objects as they navigate between delivery points, and to help prevent other people from tampering with the robot or its contents.

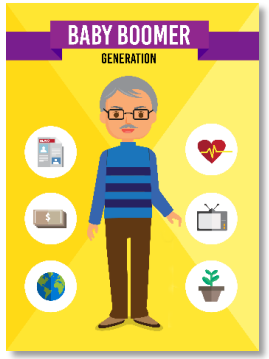
Using self-guided robots would free delivery people from having to personally carry as many items at a given time while they did their work. It would also free them from having to go back to their delivery truck as often to retrieve the additional items that they needed to deliver. This would allow the delivery person to cover a larger area in less time.

For recipients, the experience of receiving an item delivered by a carrier being helped by a self-guided robot would be about the same as it is now. When a delivery person reached an address that required a signature for delivery, the delivery person would take that item from the robot and bring it to the door. The person receiving the item would then sign for and receive the item in the same way that they would if the delivery person was not being helped by a self-guided robot.

When a delivery person made a delivery that did not require a signature, then that carrier would take the item to be delivered out of the robot and would leave it in the same way, and in the same place, as they would now.

# Findings by Segment

## *Millennials, Generation X, Baby Boomers*

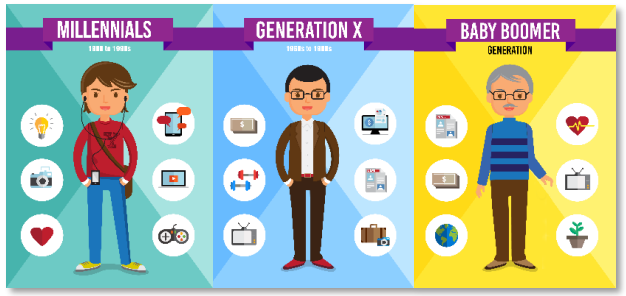



Groups in this section were defined based on responses to the question "S5. What is your age in years?" Millennials were defined as being aged 18-34, Generation X as being aged 35-49, Baby Boomers as being aged 50-75.

# SUMMARY OF FINDINGS

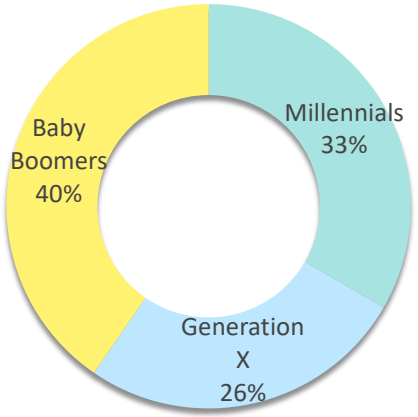
## *Millennials, Generation X, Baby Boomers*

- As compared with older generations, Millennials report being more open to and interested in receiving deliveries from robots. Millennials are:
  - More likely to have had previous exposure to the idea of delivery robots.
  - More likely to believe the concept would work in the area where they live.
  - More likely to be willing to pay for the benefits of robot delivery.
- The Helper Robot concept is a bigger winner with all three groups, but is notably better received than the Independent Delivery concept among older respondents.
- USPS experiences sizable gains in brand positivity through implementing either robot delivery concept, but the Helper Robot concept leads to larger gains — particularly among Baby Boomers.




*Sample Breakdown by*

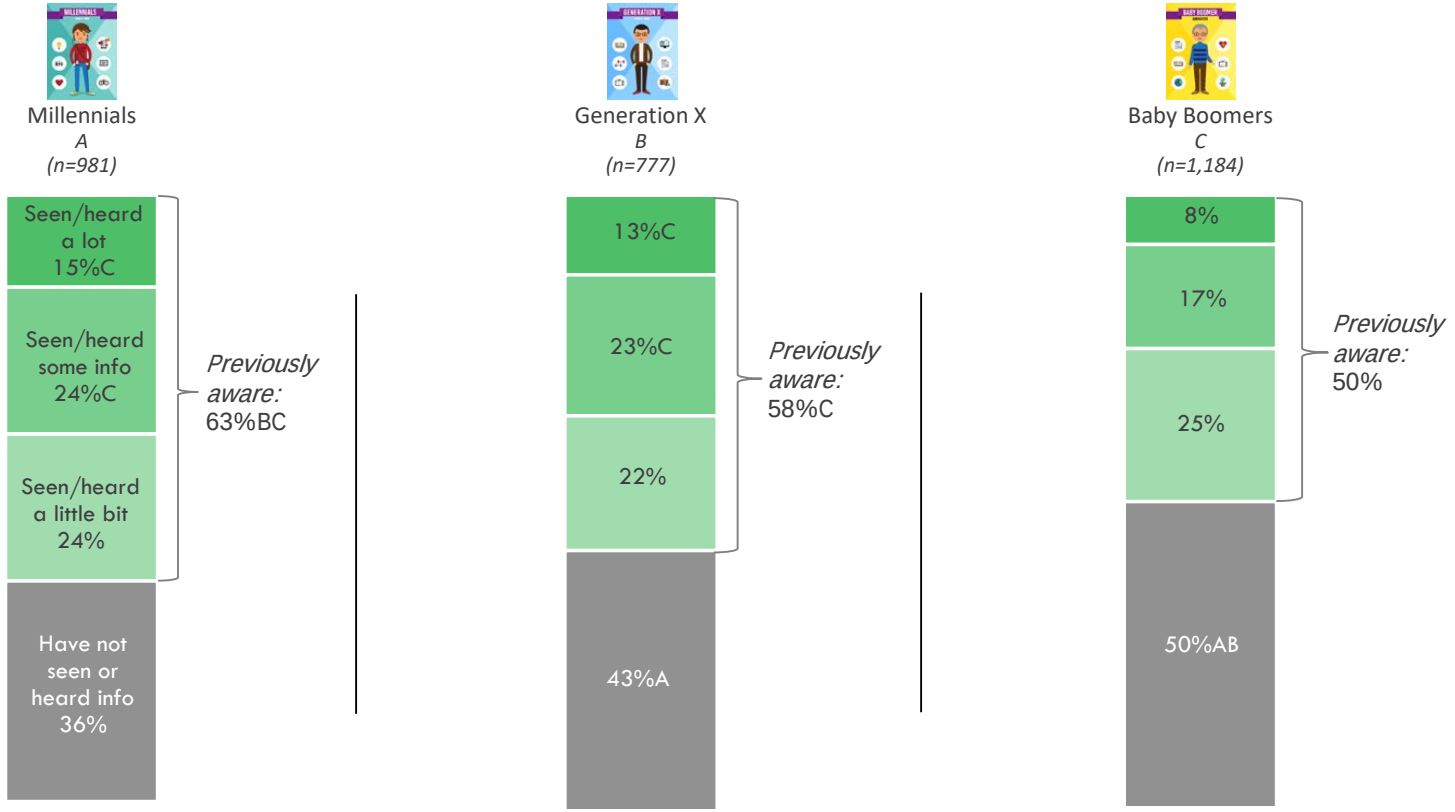
Generation




Groups in this section were defined based on responses to the question "S5. What is your age in years?" Millennials were defined as being aged 18-34, Generation X as being aged 35-49, Baby Boomers as being aged 50-75.

# Millennials report having seen or heard more about the idea of delivery robots than either Generation X or Baby Boomers.

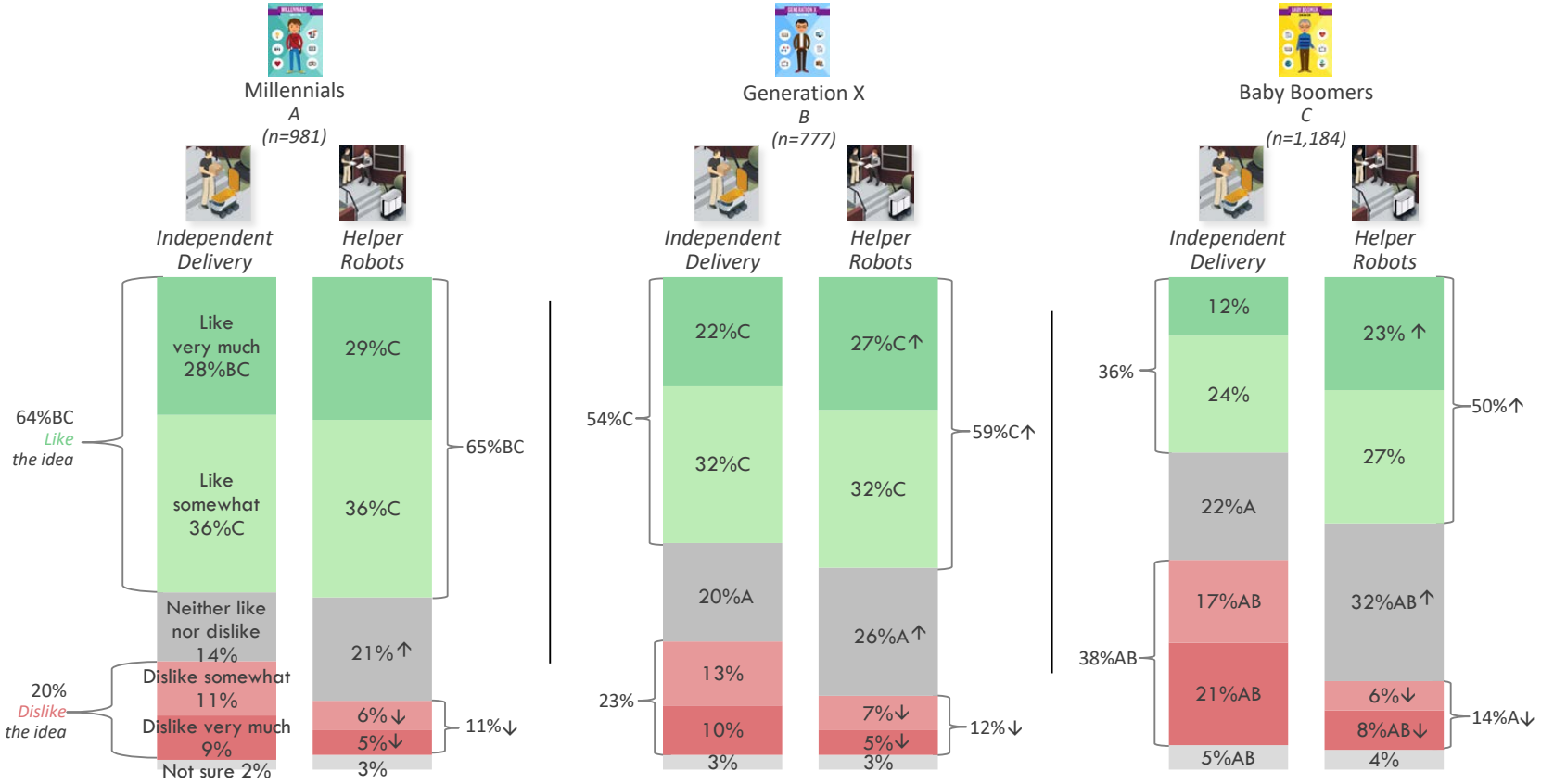
## Awareness of Overall Delivery Robot Concept




Question asked prior to exposure to descriptions of Independent Delivery and Helper Robot concepts. | Q5. Have you seen or heard anything about organizations developing the following technologies for the delivery of food, mail, priority documents, or packages? | A,B,C: Significantly higher than corresponding group at 95% c.l.

# Millennials embrace the idea of delivery robots regardless of their application, while Generation X and Baby Boomers show a preference for the Helper Robot concept.

## Liking of Delivery Robot Concepts




Questions asked following exposure to descriptions of concepts. | A/B4. Overall, how much do you like or dislike the idea of receiving deliveries from [self-guided robots/delivery people being helped by self-guided robots] as just described? | A,B,C: Significantly higher than data point in corresponding group at 95% c.l. | ↑ / ↓: Significantly higher/lower than Independent Delivery measure within same group at 95% c.l.

# Millennials are more optimistic that delivery robots would work in the areas where they live than their older counterparts.

- All groups believe that the Helper Robot concept would be more likely to work than the Independent Delivery concept.

## *Concept Feasibility "In Your Area"*

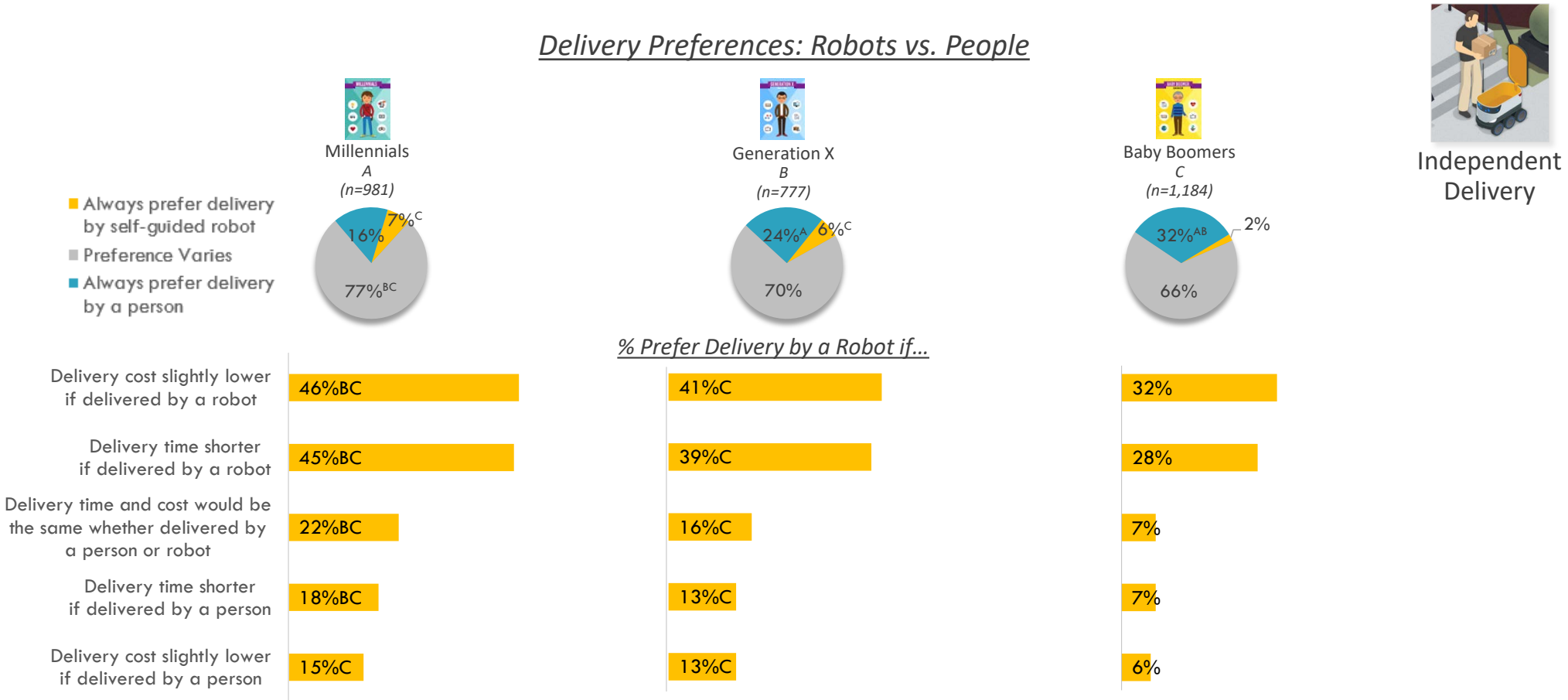
Independent Delivery

Helper Robots

| | Millennials *A* *(n=981)* | Generation X *B* *(n=777)* | Baby Boomers *C* *(n=1,184)* |
|---|---|---|---|
| Independent Delivery: Concept Would Work in My Area | 64%BC | 55%C | 35% |
| Independent Delivery: Concept Would Not Work in My Area | 30% | 38%A | 53%AB |
| Helper Robots: Concept Would Work in My Area | 69%C ↑ | 66%C ↑ | 50% ↑ |
| Helper Robots: Concept Would Not Work in My Area | 26% ↓ | 25% ↓ | 39%AB↓ |

The data shown combines scale points for clarity of presentation. | A/B5 asked following exposure to descriptions of Independent Delivery/Helper Robots concepts. | A/B5. Overall, how well do you think [the use of self-guided robots for the delivery of food, mail, priority documents, or packages/delivery people using self-guided robots to help them complete their deliveries] would work in the area where you live? (Scale: The idea would work very well; The idea would work somewhat well; The idea would not work very well; The idea would not work at all; Not sure/don't know enough to say (omitted from graph)). | 95% confidence interval (National Sample): +/- 1.8%. | A,B,C: Significantly higher than corresponding group. | ↑ / ↓: Significantly higher/lower than assessment of Independent Delivery.

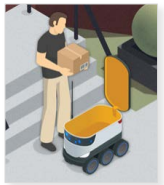
# Younger American residents are more open to the idea of receiving deliveries from an Independent Delivery robot than are older residents.




The data shown combines scale points for clarity of presentation. | Question asked following exposure to description of concept. | A6. If the technology for self-guided delivery robots was fully developed and in use today, and the below statements were true, would you prefer to receive your items from...? (Scale: Prefer to receive delivery from a self-guided robot; No preference; Prefer to receive delivery from a person; Not sure). | Question not asked for Helper Robot concept, where the robot would be accompanied by a person. | A,B,C: Significantly higher than corresponding group.

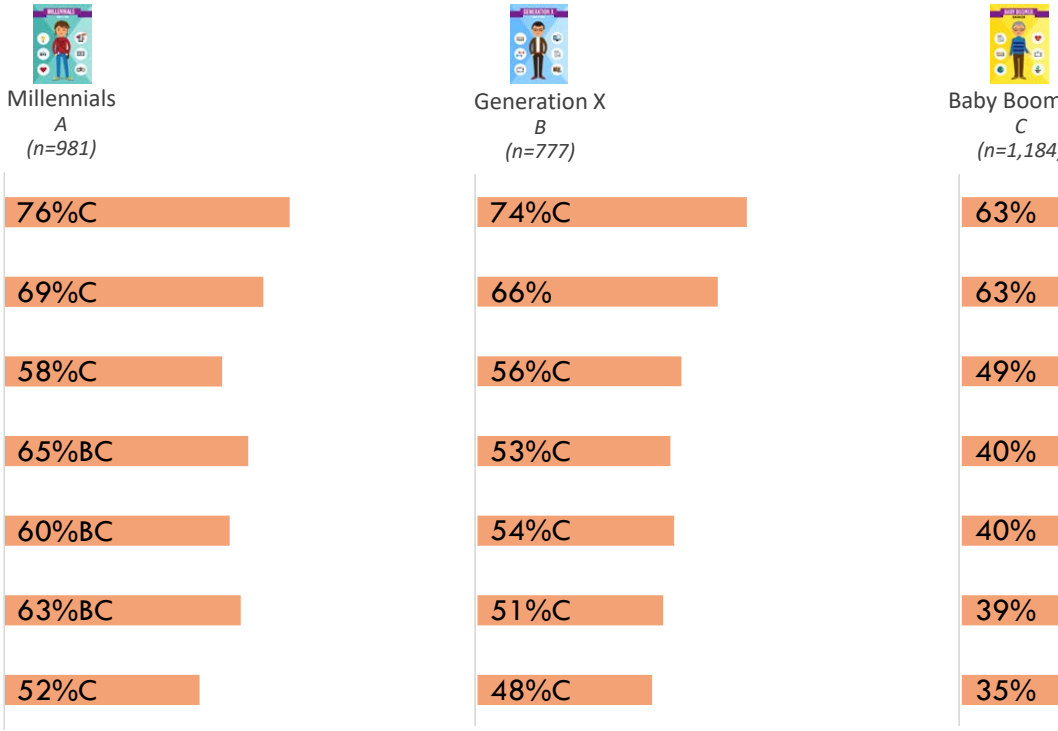
# All of the groups see flexible place and time of delivery as the major benefits of Independent Delivery.

- In general, Millennials are the most likely group to find the concept's various benefits believable.



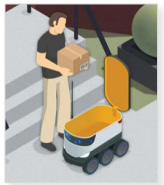
Independent Delivery

*Percent Believing That the Independent Delivery Concept Would…*




The data shown combines scale points for clarity of presentation. | All questions asked following exposure to description of concept. | A8. To what extent do you agree or disagree that using self-guided robots as we just described for the delivery of food, mail, priority documents, or packages would…? (Scale: Strongly agree; Somewhat agree; Neither agree nor disagree (not shown); Somewhat disagree (not shown); Strongly disagree (not shown)). | A,B,C: Significantly higher than corresponding group.

# Millennials are more likely than Generation X or Baby Boomers to say that they are willing to pay more for the benefits of receiving delivery from Independent Delivery robots.



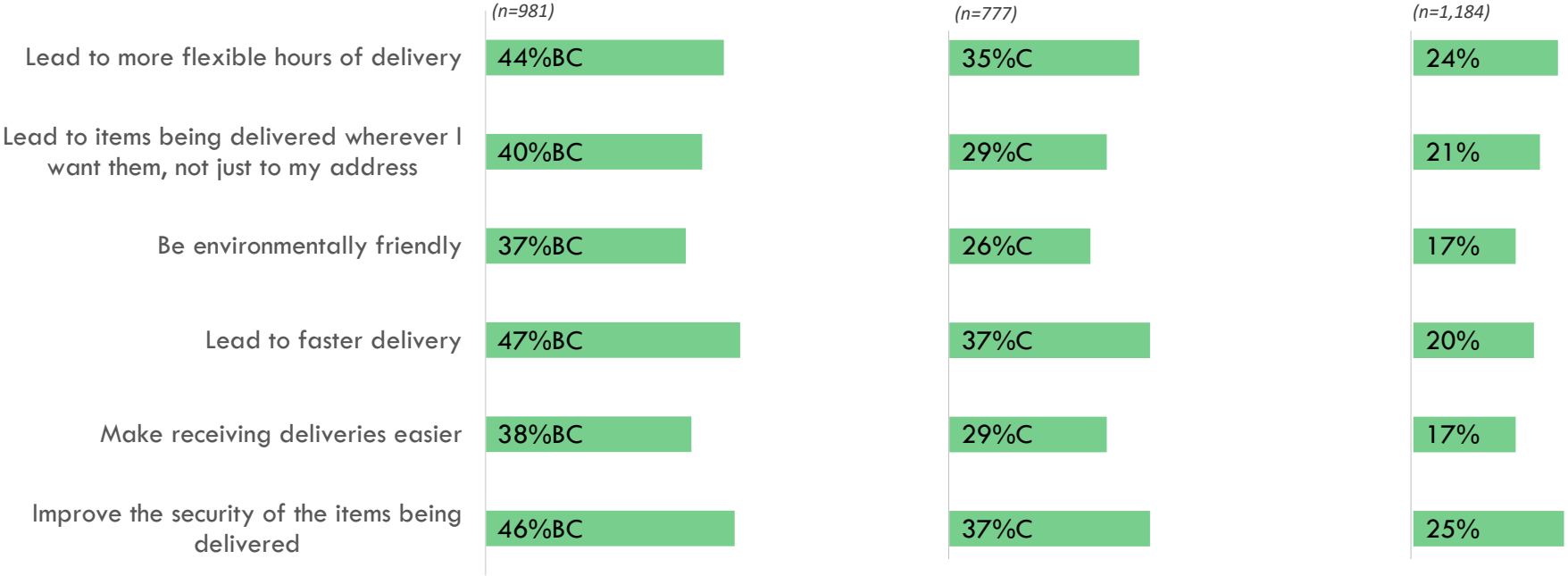
Independent Delivery

*Percent Willing to Pay Slightly More to Receive This Benefit*

Millennials
*A*
*(n=981)*

Generation X
*B*
*(n=777)*

Baby Boomers
*C*
*(n=1,184)*



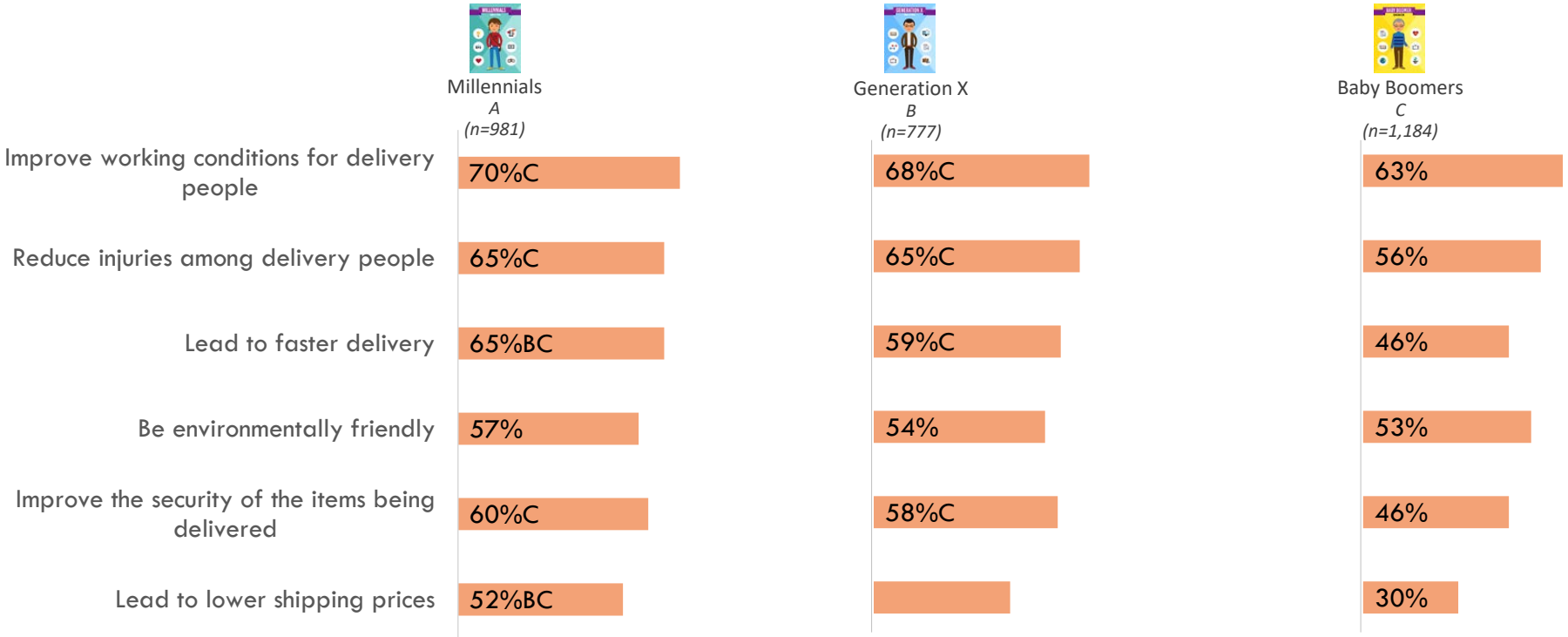

The data shown combines scale points for clarity of presentation. | All questions asked following exposure to description of concept. | A9. Would you be willing to pay slightly more for delivery by self-guided robots if you knew that their use would…? (Scale: I would pay slightly more, I would not pay slightly more (not shown); Not sure (not shown)). | 95% confidence interval (National Sample): +/- 1.8%. | A,B,C: Significantly higher than corresponding group.

# All groups agree that Helper Robots would improve working conditions for carriers.

- Baby Boomers and Generation X are more skeptical than Millennials that the use of Helper Robots would lead to lower shipping prices or faster delivery.

Helper Robots

*Percent Believing That the Helper Robot Concept Would…*



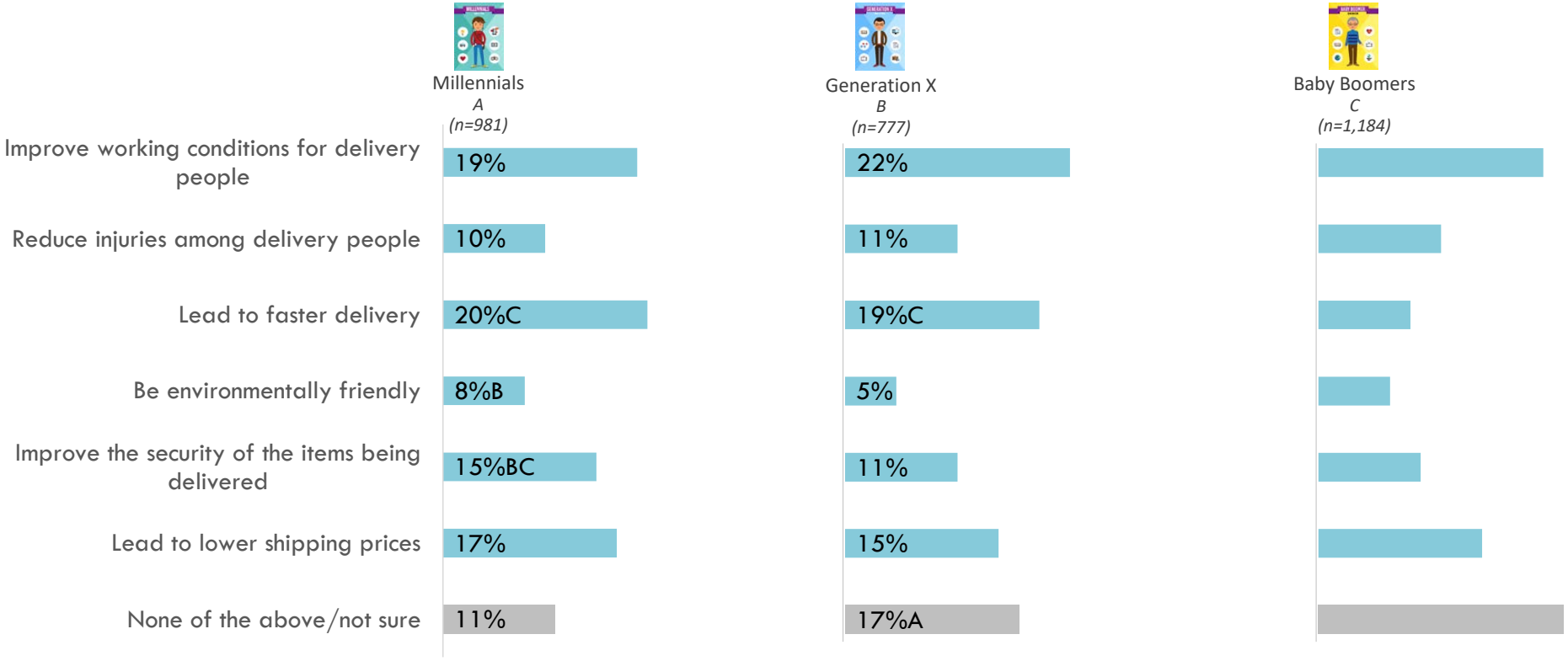

The data shown combines scale points for clarity of presentation. | All questions asked following exposure to description of concept. | B7. To what extent do you agree or disagree that using self-guided robots to help delivery people complete their work as we just described would…? (Scale: Strongly agree; Somewhat agree; Neither agree nor disagree (not shown); Somewhat disagree (not shown); Strongly disagree (not shown)). | A,B,C: Significantly higher than corresponding group.

# All of the groups find improved working conditions for delivery people and lower shipping prices to be similarly appealing Helper Robot benefits.

- Faster delivery is also very appealing to Millennials and Generation X.

Helper Robots

*Most Personally Appealing Benefit of Helper Robots*




The data shown combines scale points for clarity of presentation. | All questions asked following exposure to description of concept. | B8. Assuming that they were all true, which, if any, of the below benefits of using self-guided robots to help delivery people complete their work would be the most appealing to you personally? | A,B,C: Significantly higher than corresponding group.

# Generation X and Baby Boomers trust USPS least to implement Independent Delivery robots, but Millennials rank USPS third, above FedEx.

Independent Delivery

## Average Ranking as Trusted Brand for Implementing Independent Delivery Robots

Rank Within Group *(Average Rank)*

| | Millennials *(n=908)* | Generation X *(n=749)* | Baby Boomers *(n=1,080)* |
|---|---|---|---|
| *Top Ranked Among National Sample* amazon.com | 1 (1.91) | 1 (1.94) | 1 (2.28) |
| UPS | 2 (2.64) | 2 (2.60) | 2 (2.48) |
| FedEx | 4 (2.80) | 3 (2.66) | 3 (2.52) |
| *Bottom Ranked Among National Sample* United States Postal Service | 3 (2.65) | 4 (2.80) | 4 (2.73) |

Findings presented are based on respondents slightly familiar or more with all brands at Q2. How familiar are you with the following organizations? | Question asked following exposure to descriptions of concepts. | A11. Please rank the following organizations from 1 to 4, where 1 is the organization you would most trust to use self-guided robots for the delivery of food, mail, priority documents, or packages, and 4 is the organization you would least trust to use self-guided robots for the delivery of food, mail, priority documents, or packages.

# All three generations see USPS as a better fit for Helper Robots than Independent Delivery robots. Millennials and Baby Boomers trust USPS the second most, and Generation X ranks them third as a trusted brand for implementing the concept.

Helper Robots

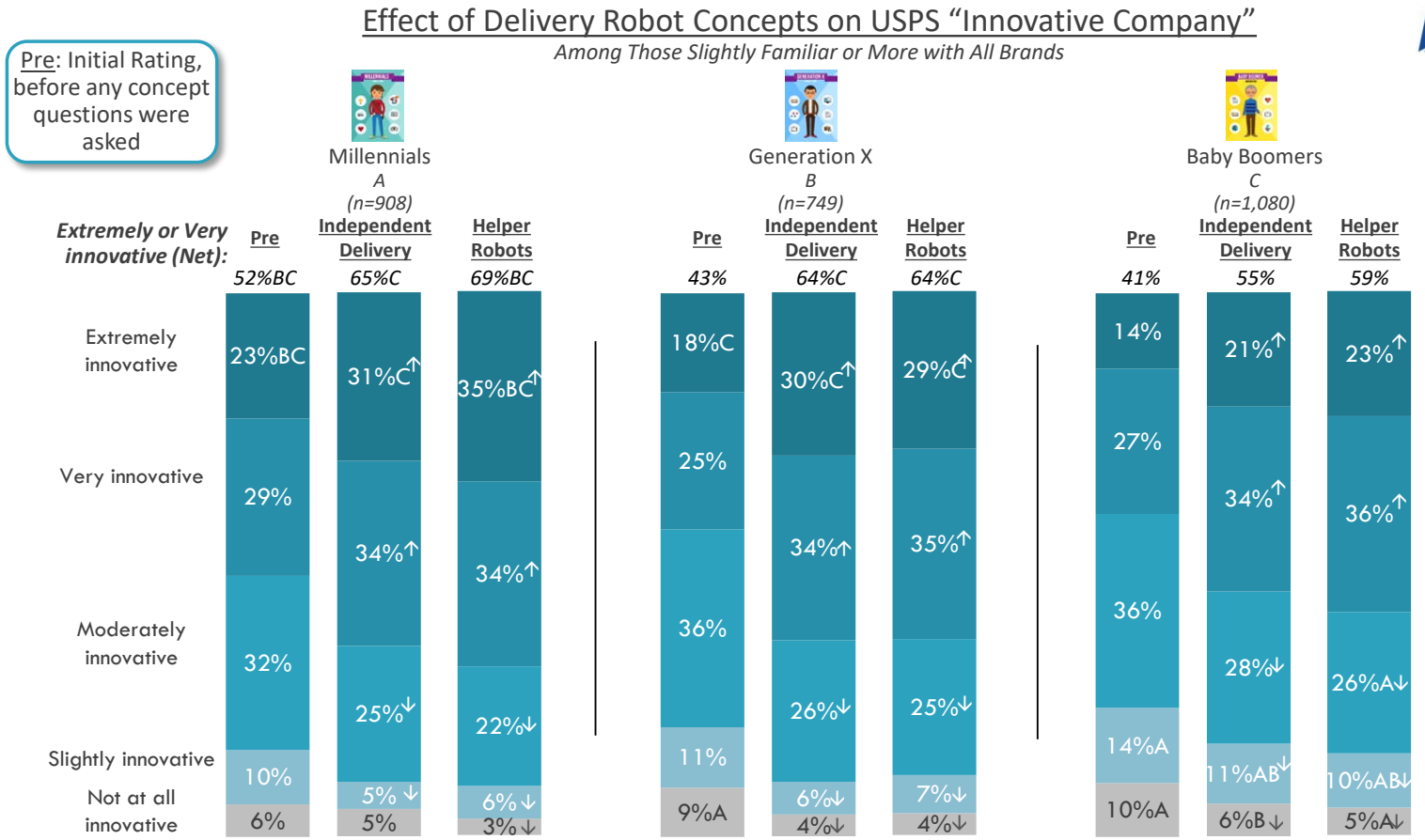
## Average Ranking as Trusted Brand for Implementing Helper Robots

Rank Within Group *(Average Rank)*

| | Millennials *(n=908)* | Generation X *(n=749)* | Baby Boomers *(n=1,080)* |
|---|---|---|---|
| *Top Ranked Among National Sample* amazon.com | 1 (2.07) | 1 (2.12) | 4 (2.55) |
| UPS | 3 (2.61) | 2 (2.55) | 1 (2.43) |
| UNITED STATES POSTAL SERVICE | 2 (2.56) | 3 (2.65) | 2 (2.50) |
| *Bottom Ranked Among National Sample* FedEx | 4 (2.77) | 4 (2.69) | 3 (2.53) |

Findings presented are based on respondents slightly familiar or more with all brands at Q2. How familiar are you with the following organizations? | Question asked following exposure to descriptions of concepts. | B10. Please rank the following organizations from 1 to 4, where 1 is the organization you would most trust to use self-guided robots to help delivery people complete their work, and 4 is the organization you would least trust to use self-guided robots to help delivery people complete their work.

# Implementing any delivery robot concept improves USPS' reputation as an innovative organization, but the more popular Helper Robot concept leads to larger gains.

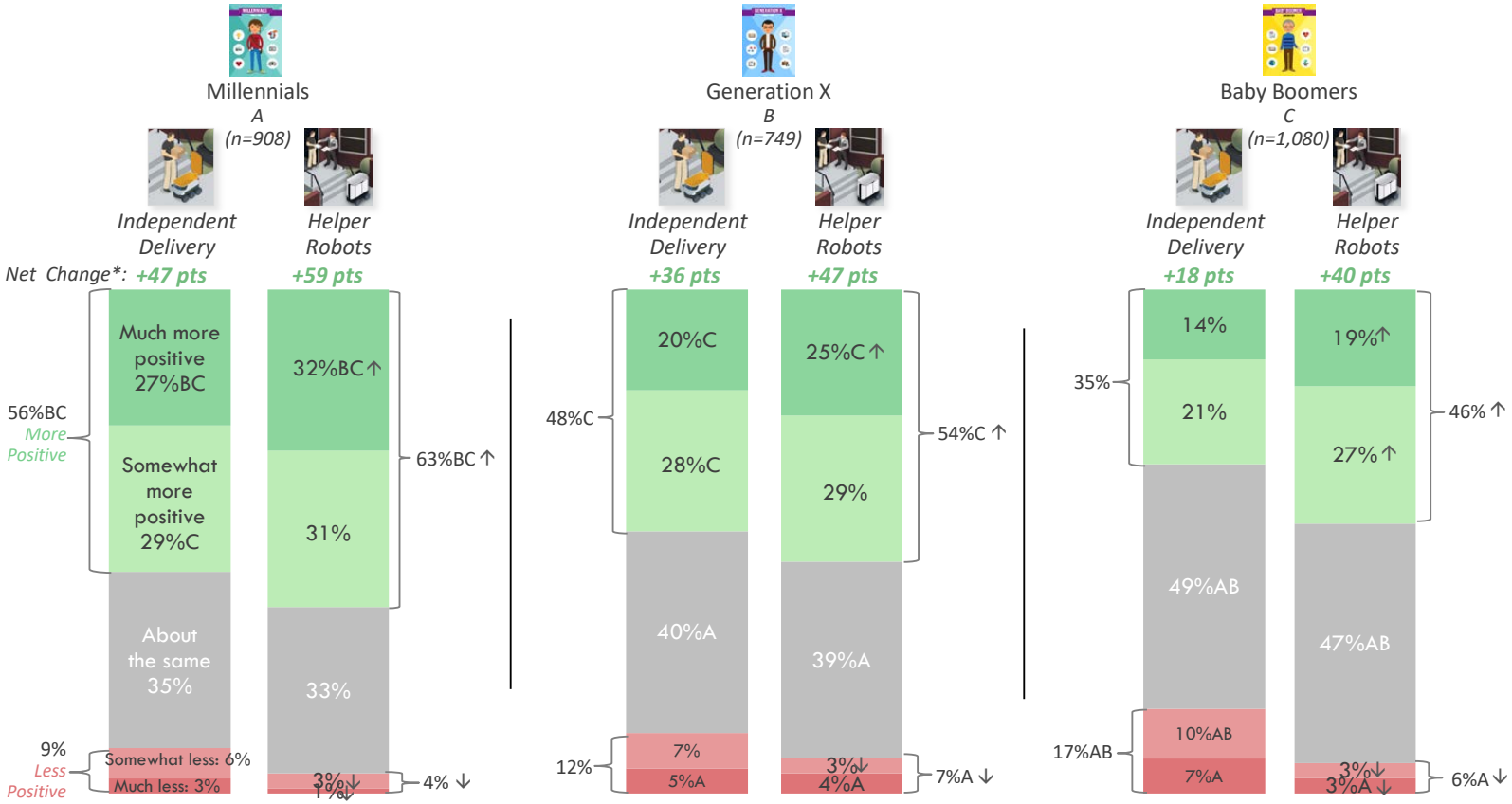



Findings presented are based on respondents slightly familiar or more with all brands at Q2. How familiar are you with the following organizations? | Q4 asked prior to exposure to descriptions of concepts, A13/B12 asked following concept exposure. | Q4. Overall, how innovative do you feel the following organizations are? | A13/B12. How innovative would you feel that the following organizations were if you knew that they would be using self-guided robots [for the delivery of food, mail, priority documents, or packages/to help delivery people complete their work]? | A,B,C: Significantly higher than data point in corresponding group at 95% c.l. | ↑ / ↓: Significantly higher/lower than pre measure within same group at 95% c.l.

# Both delivery robot concepts lead to large net increases in brand positivity. Among Baby Boomers, that increase is much more dramatic when USPS implements the Helper Robots concept.

## Effect of Delivery Robot Concepts on USPS Brand Positivity

*Among Slightly Familiar or More with All Brands*




Findings presented are based on respondents slightly familiar or more with all brands at Q2. How familiar are you with the following organizations? | Questions asked following exposure to descriptions of concepts. | A12/B11. Would your overall impression of the following organizations be more or less positive if you knew that they would be using self-guided robots [for the delivery of food, mail, priority documents, or packages/to help delivery people complete their work]? | *Net Change = (More Positive – Less Positive). | A,B,C: Significantly higher than data point in corresponding group at 95% c.l. | ↑ / ↓: Significantly higher/lower than pre measure within same group at 95% c.l.

# Findings by Segment

## *Urban /Suburban /Rural*

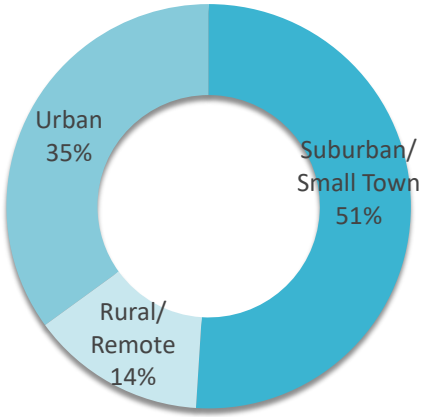
Groups in this section were defined based on responses to the question “S3. Which of the following best describes the area where you live?” Respondents classified as Urban answered “A city or urban area.” Respondents classified as Suburban answered “A town or suburban area” or “A small town.” Respondents classified as Rural answered “A rural area” or “A remote area with few other nearby residents.”

# SUMMARY OF FINDINGS

## *Urban — Suburban/Small Town — Rural/Remote*

- None of the areas of residence report being strongly opposed to the idea of delivery robots, but urban residents are generally more positive — and rural/remote residents more negative — about the concepts presented.
- The Helper Robot concept is more popular than the Independent Delivery concept in all three areas of residence, but that difference is much larger in Rural/Remote areas.
- Most Urban residents believe that both delivery robot concepts would work where they live, but more than half of the Rural/Remote respondents believe that the concepts would not work in their area.
- Urban residents rank USPS behind only Amazon as trusted brand for implementing the Helper Robot concept.

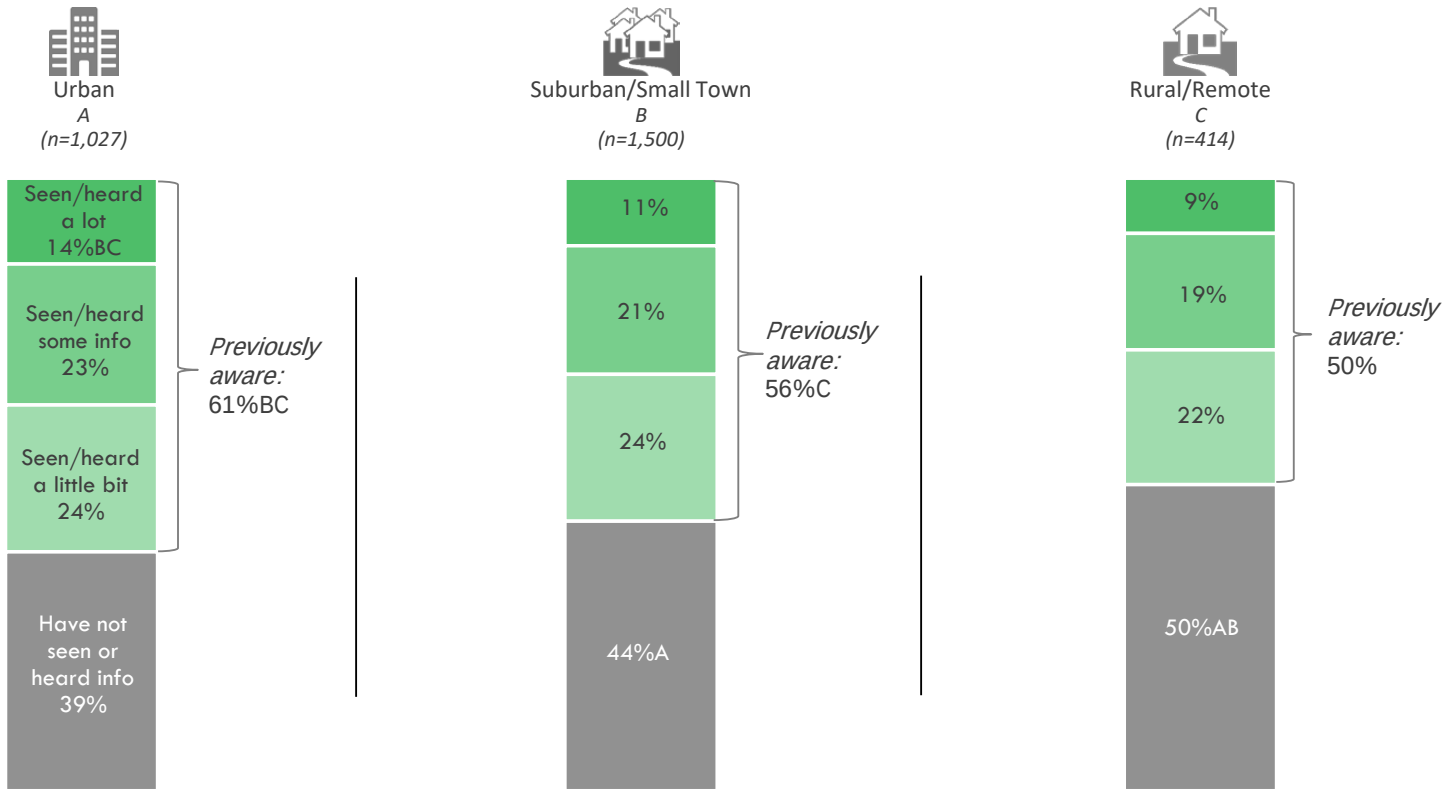
*Sample Breakdown by*
Self-Reported Area of Residence




Groups in this section were defined based on responses to the question "S3. Which of the following best describes the area where you live?" Respondents classified as Urban answered "A city or urban area." Respondents classified as Suburban answered "A town or suburban area" or "A small town." Respondents classified as Rural answered "A rural area" or "A remote area with few other nearby residents."

# Urban residents report having had more previous exposure to the idea of delivery robots than residents of suburban or rural areas.

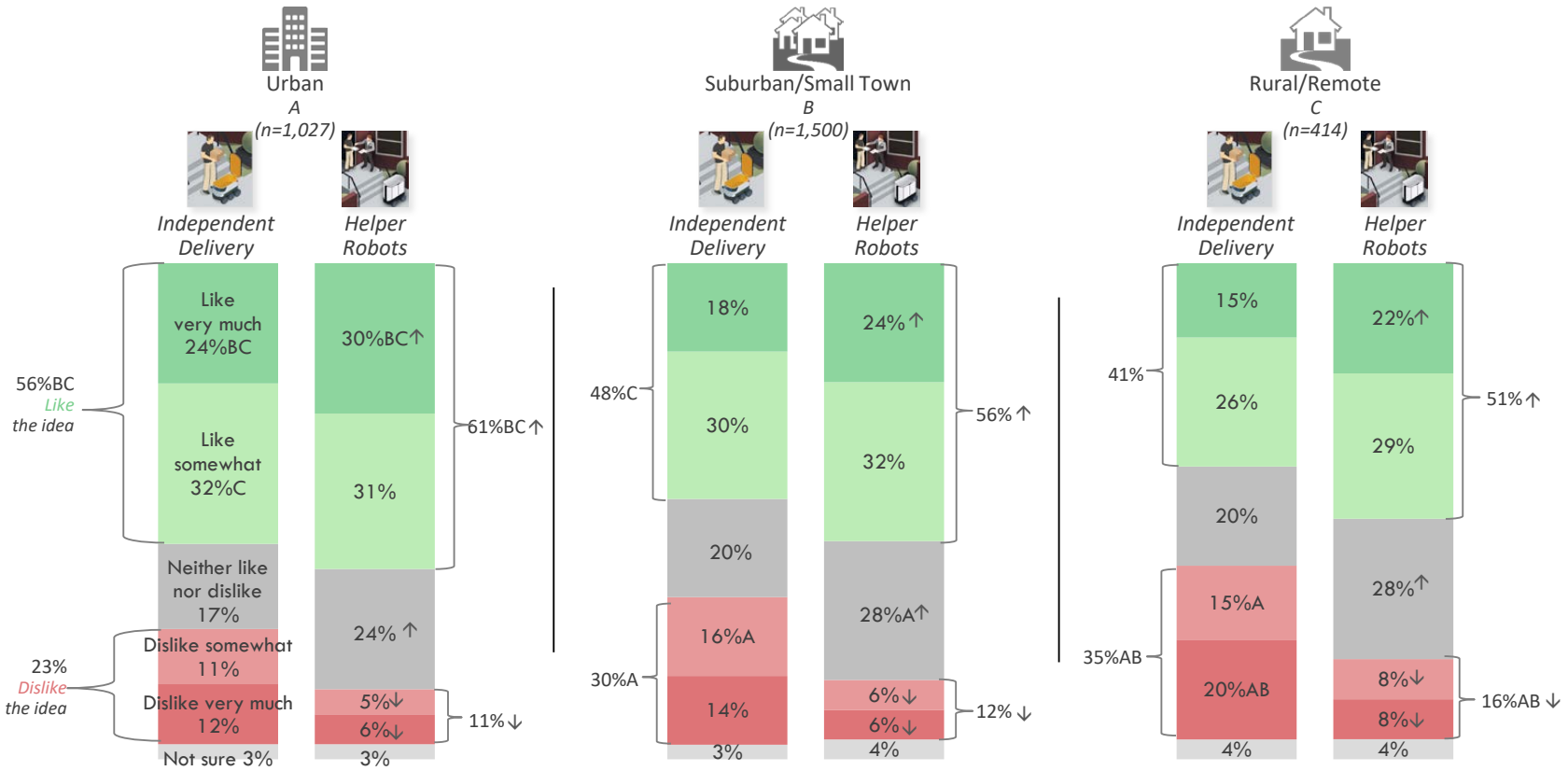
## Awareness of Overall Delivery Robot Concept




Question asked prior to exposure to descriptions of Independent Delivery and Helper Robot concepts. | Q5. Have you seen or heard anything about organizations developing the following technologies for the delivery of food, mail, priority documents, or packages? | A,B,C: Significantly higher than corresponding group at 95% c.l.

# All of the groups prefer the Helper Robot concept to the Independent Delivery concept, but that difference is greatest in Rural/Remote areas.

## Liking of Delivery Robot Concepts




Questions asked following exposure to descriptions of concepts. | A/B4. Overall, how much do you like or dislike the idea of receiving deliveries from [self-guided robots/delivery people being helped by self-guided robots] as just described? | A,B,C: Significantly higher than data point in corresponding group at 95% c.l. | ↑ / ↓: Significantly higher/lower than Independent Delivery measure within same group at 95% c.l.

# Most urbanites believe that either delivery robot concept would work in the area where they live.

- The majority of Rural/Remote residents, however, are skeptical that either delivery robot concept could work in their area.

## *Concept Feasibility "In Your Area"*

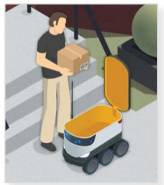
Independent Delivery

Helper Robots

| | Urban<br>*A*<br>*(n=1,027)* | Suburban/Small Town<br>*B*<br>*(n=1,500)* | Rural/Remote<br>*C*<br>*(n=414)* |
|---|---|---|---|
| Independent Delivery: Concept Would Work in My Area | 59%BC | 48%C | 35% |
| Independent Delivery: Concept Would Not Work in My Area | 32% | 44%A | 57%AB |
| Helper Robots: Concept Would Work in My Area | 68%BC↑ | 61%C↑ | 39% |
| Helper Robots: Concept Would Not Work in My Area | 24%↓ | 30%A↓ | 51%AB |

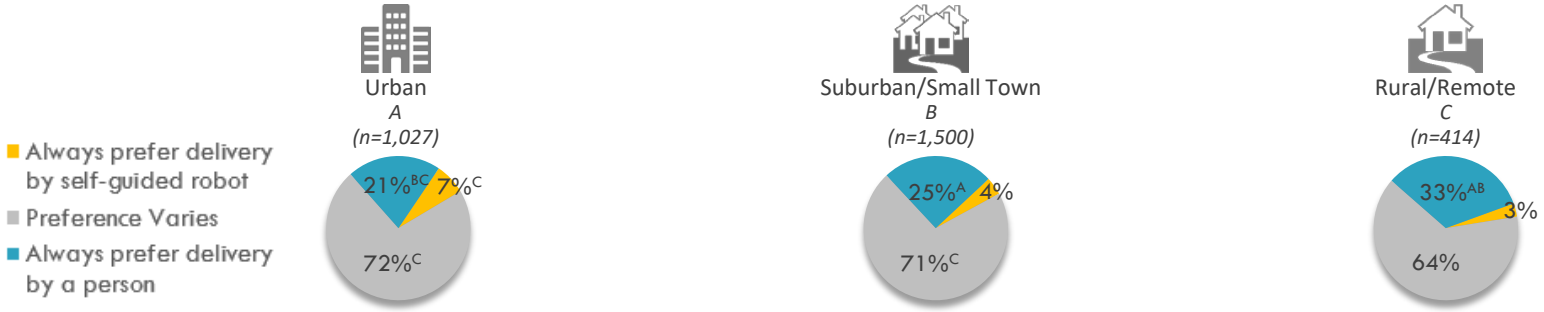
The data shown combines scale points for clarity of presentation. | A/B5 asked following exposure to descriptions of Independent Delivery/Helper Robots concepts. | A/B5. Overall, how well do you think [the use of self-guided robots for the delivery of food, mail, priority documents, or packages/delivery people using self-guided robots to help them complete their deliveries] would work in the area where you live? (Scale: The idea would work very well; The idea would work somewhat well; The idea would not work very well; The idea would not work at all; Not sure/don't know enough to say (omitted from graph)). | 95% confidence interval (National Sample): +/- 1.8%. | A,B,C: Significantly higher than corresponding group. | ↑ / ↓: Significantly higher/lower than assessment of Independent Delivery.

## Less Rural/Remote residents report preferring delivery by independent robots to delivery by people, compared with those in other areas. Still, even in these communities a sizable number reports being interested in the concept if it results in faster or cheaper delivery.

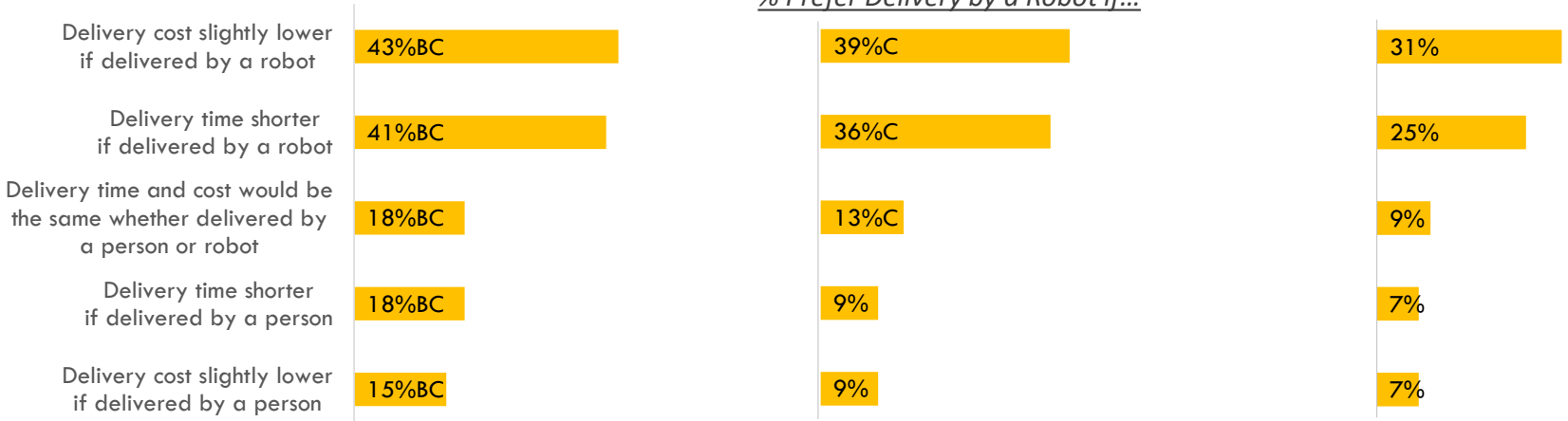


Independent Delivery

### *Delivery Preferences: Robots vs. People*

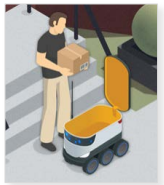



### *% Prefer Delivery by a Robot if…*



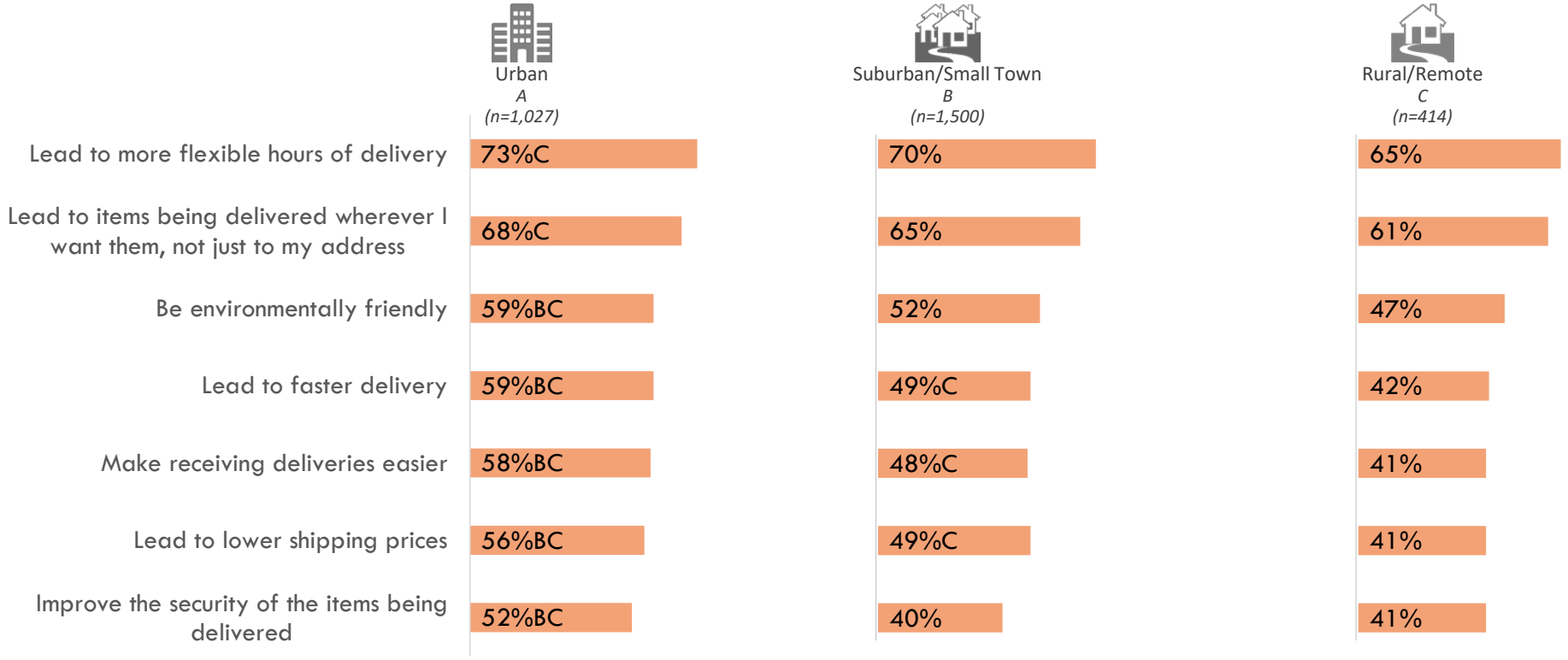

The data shown combines scale points for clarity of presentation. | Question asked following exposure to description of concept. | A6. If the technology for self-guided delivery robots was fully developed and in use today, and the below statements were true, would you prefer to receive your items from…? (Scale: Prefer to receive delivery from a self-guided robot; No preference; Prefer to receive delivery from a person; Not sure). | Question not asked for Helper Robot concept, where the robot would be accompanied by a person. | A,B,C: Significantly higher than corresponding group.

# Respondents from all of the areas of residence view flexible delivery time and place as Independent Delivery's most believable benefits. Rural/Remote residents are more skeptical than others about the concept's benefits in general.



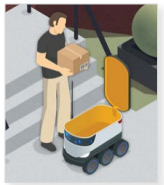
Independent Delivery

*Percent Believing That the Independent Delivery Concept Would…*



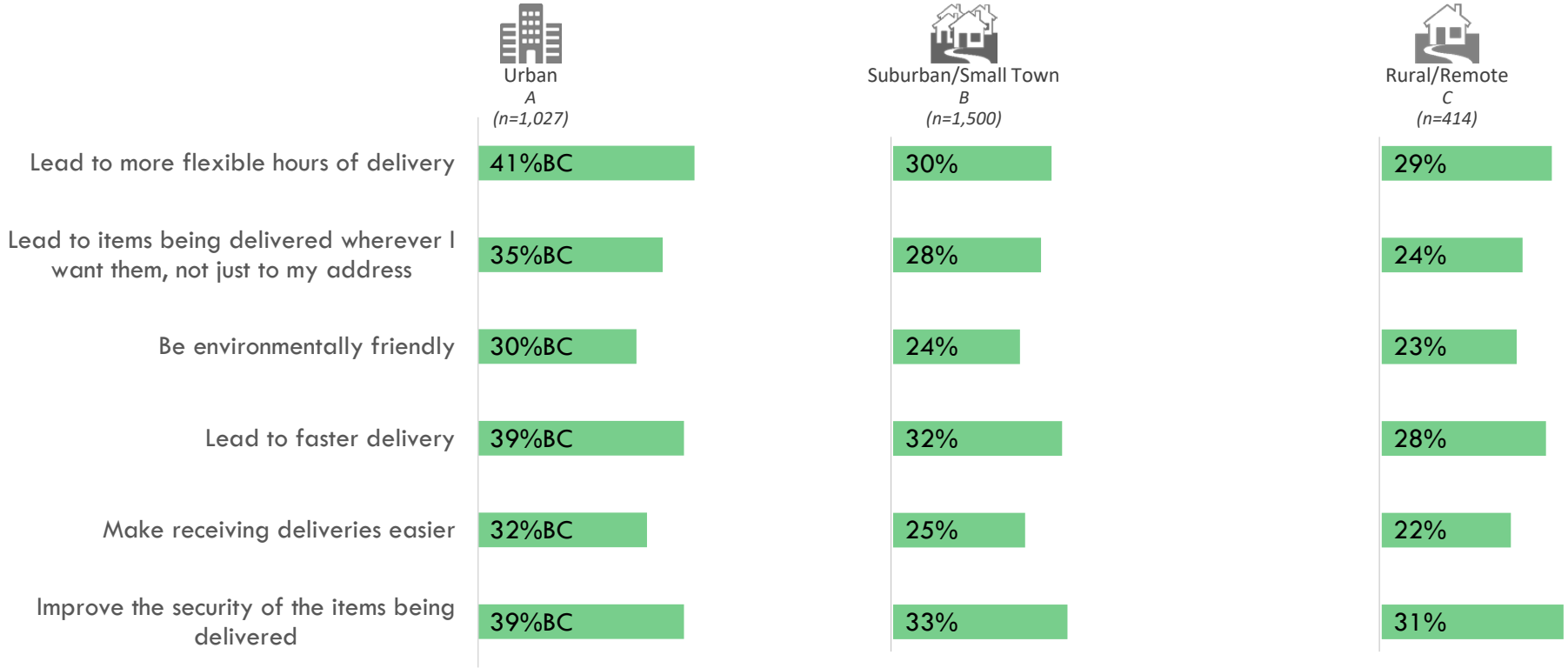

The data shown combines scale points for clarity of presentation. | All questions asked following exposure to description of concept. | A8. To what extent do you agree or disagree that using self-guided robots as we just described for the delivery of food, mail, priority documents, or packages would…? (Scale: Strongly agree; Somewhat agree; Neither agree nor disagree (not shown); Somewhat disagree (not shown); Strongly disagree (not shown)). | A,B,C: Significantly higher than corresponding group.

## At least some residents in all areas say that they would be willing to pay slightly more to receive the benefits of Independent Delivery robots — particularly for improved security, increased flexibility, or improved speed. Urban residents report being the most willing to pay.



Independent Delivery

*Percent Willing to Pay Slightly More to Receive This Benefit*

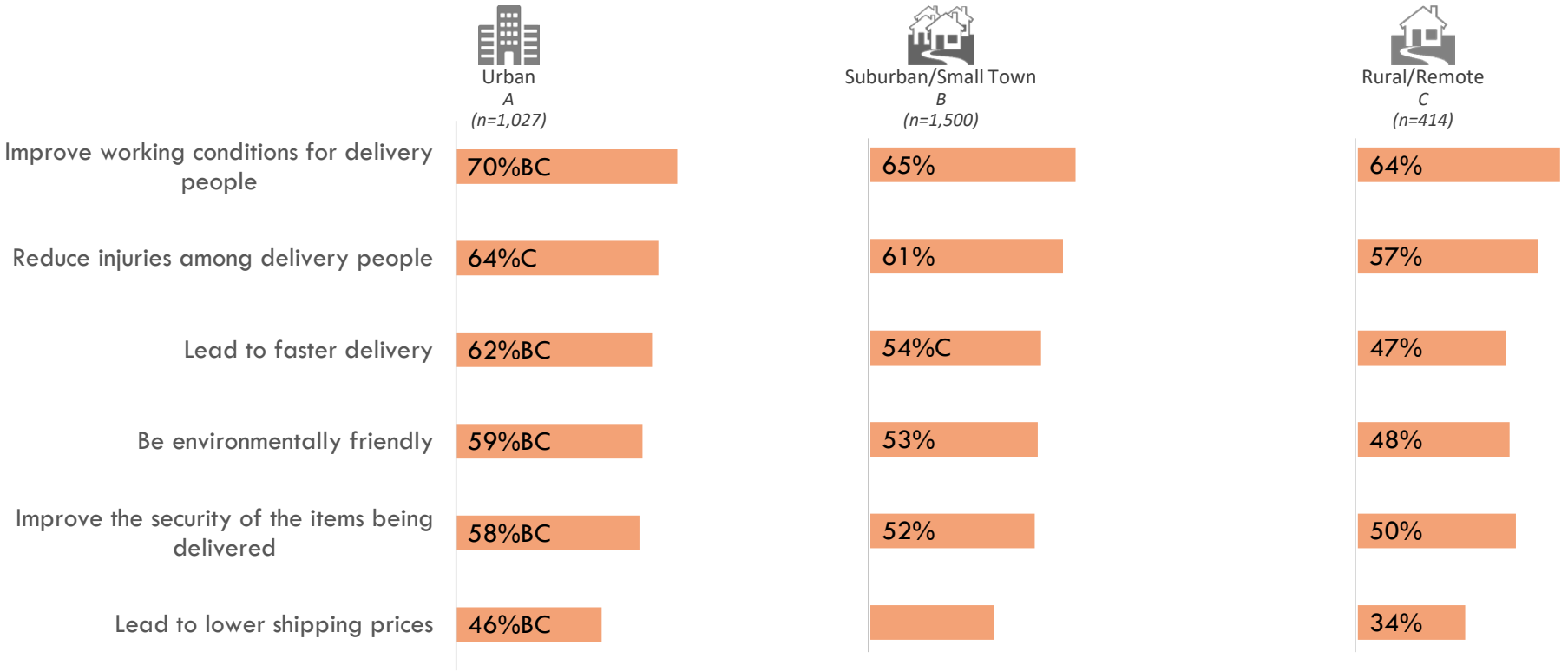



The data shown combines scale points for clarity of presentation. | All questions asked following exposure to description of concept. | A9. Would you be willing to pay slightly more for delivery by self-guided robots if you knew that their use would…? (Scale: I would pay slightly more, I would not pay slightly more (not shown); Not sure (not shown)). | 95% confidence interval (National Sample): +/- 1.8%. | A,B,C: Significantly higher than corresponding group.

# Respondents agree that Helper Robots could improve working conditions and reduce injuries for carriers. Urban residents find the potential benefits of Helper Robots to be more believable than residents in Suburban/Small Town or Rural/Remote areas.

Helper Robots

*Percent Believing That the Helper Robot Concept Would…*

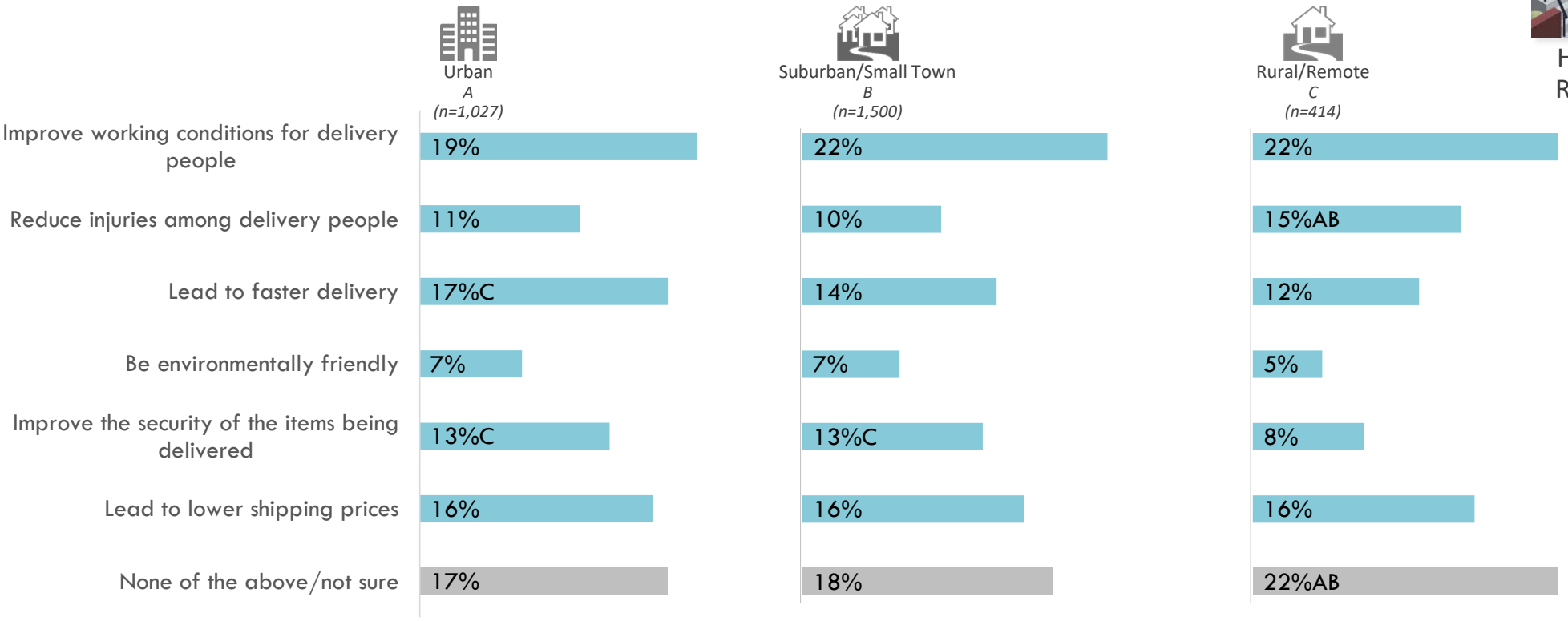



The data shown combines scale points for clarity of presentation. | All questions asked following exposure to description of concept. | B7. To what extent do you agree or disagree that using self-guided robots to help delivery people complete their work as we just described would…? (Scale: Strongly agree; Somewhat agree; Neither agree nor disagree (not shown); Somewhat disagree (not shown); Strongly disagree (not shown)) | A,B,C: Significantly higher than corresponding group.

# Improving working conditions for delivery people is the concept's most appealing benefit. Faster delivery is particularly appealing to urban residents.

Helper Robots

*Most Personally Appealing Benefit of Helper Robots*




The data shown combines scale points for clarity of presentation. | All questions asked following exposure to description of concept. | B8. Assuming that they were all true, which, if any, of the below benefits of using self-guided robots to help delivery people complete their work would be the most appealing to you personally? | A,B,C: Significantly higher than corresponding group.

# All groups rank Amazon and UPS first and second as their trusted brand to implement Independent Delivery robots. Urban and Rural/Remote residents trust USPS more than FedEx.

Independent Delivery

## Average Ranking as Trusted Brand for Implementing Independent Delivery Robots

Rank Within Group *(Average Rank)*

| | Urban *A* *(n=952)* | Suburban/Small Town *B* *(n=1,407)* | Rural/Remote *C* *(n=377)* |
|---|---|---|---|
| *Top Ranked Among National Sample* amazon.com | 1 (2.08) | 1 (2.02) | 1 (2.18) |
| UPS | 2 (2.61) | 2 (2.58) | 2 (2.41) |
| FedEx | 4 (2.67) | 3 (2.61) | 4 (2.72) |
| *Bottom Ranked Among National Sample* UNITED STATES POSTAL SERVICE | 3 (2.64) | 4 (2.79) | 3 (2.69) |

Findings presented are based on respondents slightly familiar or more with all brands at Q2. How familiar are you with the following organizations? | Question asked following exposure to descriptions of concepts. | A11. Please rank the following organizations from 1 to 4, where 1 is the organization you would most trust to use self-guided robots for the delivery of food, mail, priority documents, or packages, and 4 is the organization you would least trust to use self-guided robots for the delivery of food, mail, priority documents, or packages.

# Urban residents rank USPS behind only Amazon as trusted brand for implementing the Helper Robot concept. Rural/Remote residents rank it third and Suburban/Small Town residents rank it last.

Helper Robots

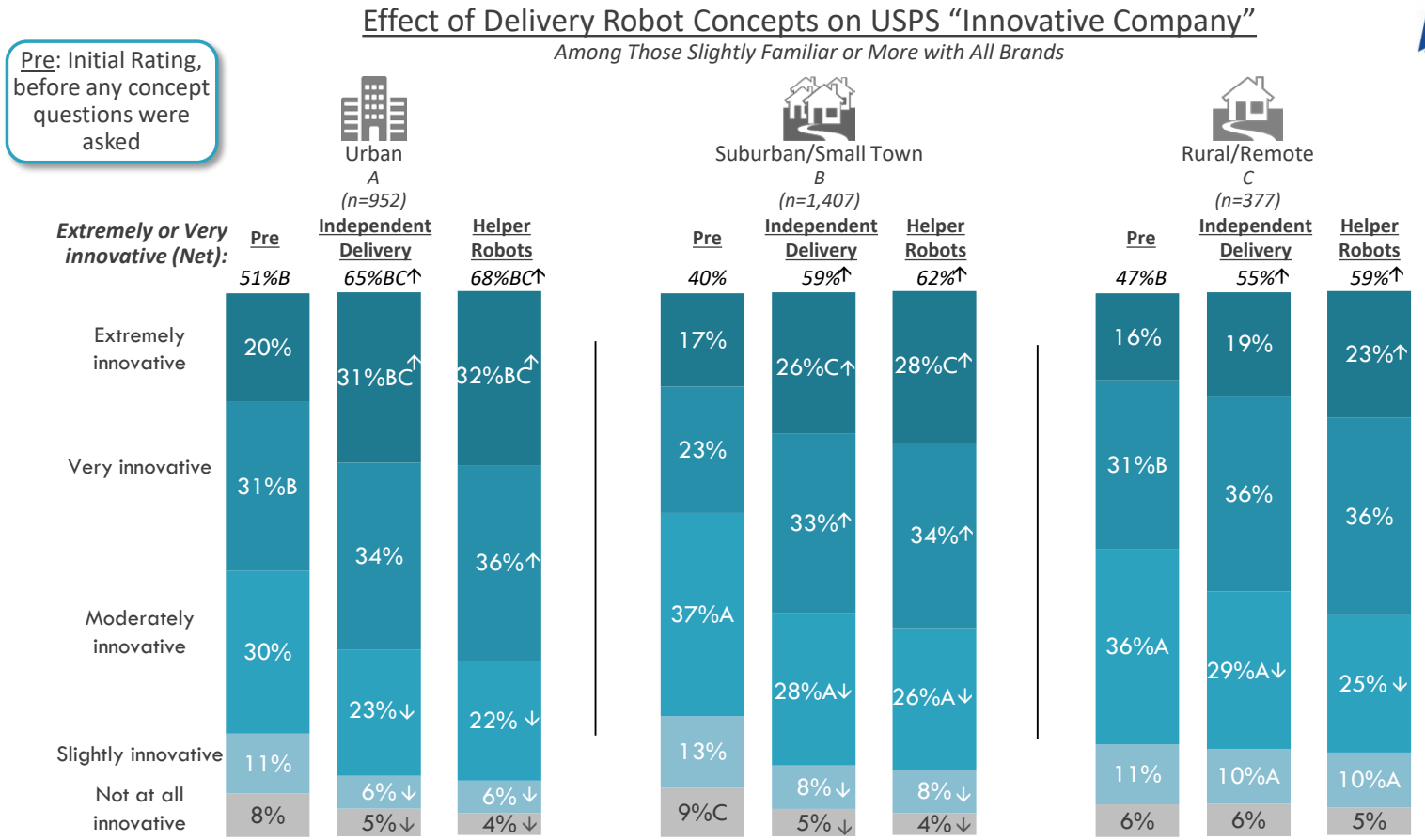
## Average Ranking as Trusted Brand for Implementing Helper Robots

Rank Within Group *(Average Rank)*

| | Urban *A* *(n=952)* | Suburban/Small Town *B* *(n=1,407)* | Rural/Remote *C* *(n=377)* |
|---|---|---|---|
| *Top Ranked Among National Sample* amazon.com | 1 (2.24) | 1 (2.27) | 1 (2.37) |
| UPS | 3 (2.57) | 2 (2.52) | 1 (2.37) |
| UNITED STATES POSTAL SERVICE | 2 (2.49) | 4 (2.61) | 3 (2.54) |
| *Bottom Ranked Among National Sample* FedEx | 4 (2.71) | 3 (2.6) | 4 (2.72) |

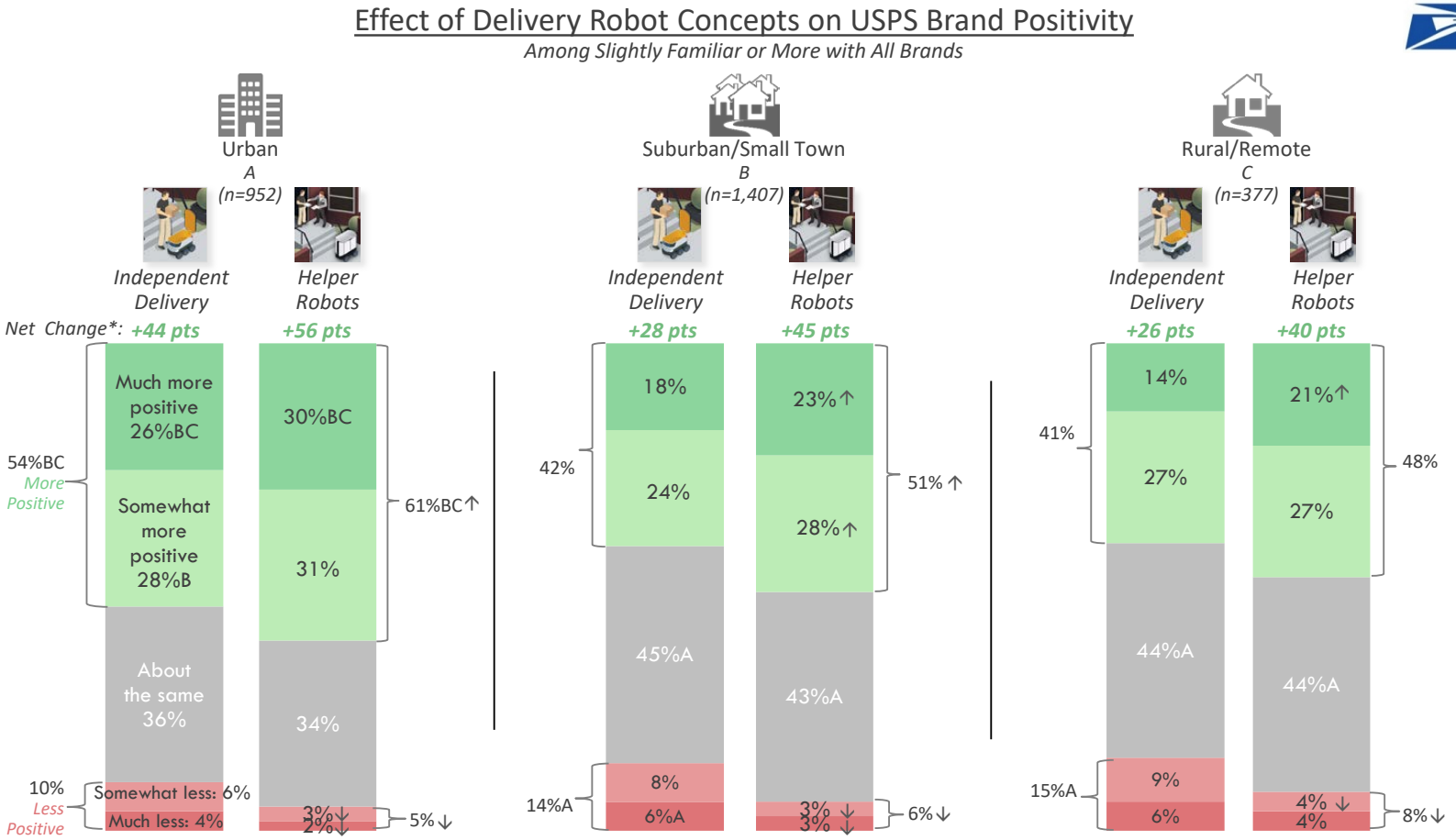
Findings presented are based on respondents slightly familiar or more with all brands at Q2. How familiar are you with the following organizations? | Question asked following exposure to descriptions of concepts. | B10. Please rank the following organizations from 1 to 4, where 1 is the organization you would most trust to use self-guided robots to help delivery people complete their work, and 4 is the organization you would least trust to use self-guided robots to help delivery people complete their work.

# Implementing a delivery robot concept leads to improved perception of USPS as an innovative company — particularly among Suburban/Small Town residents.




Findings presented are based on respondents slightly familiar or more with all brands at Q2. How familiar are you with the following organizations? | Q4 asked prior to exposure to descriptions of concepts, A13/B12 asked following concept exposure. | Q4. Overall, how innovative do you feel the following organizations are? | A13/B12. How innovative would you feel that the following organizations were if you knew that they would be using self-guided robots [for the delivery of food, mail, priority documents, or packages/to help delivery people complete their work]? | A,B,C: Significantly higher than data point in corresponding group at 95% c.l. | ↑ / ↓: Significantly higher/lower than pre measure within same group at 95% c.l.

# Both delivery robot concepts lead to increased brand positivity for USPS, but that increase is much greater when implementing the Helper Robot concept.



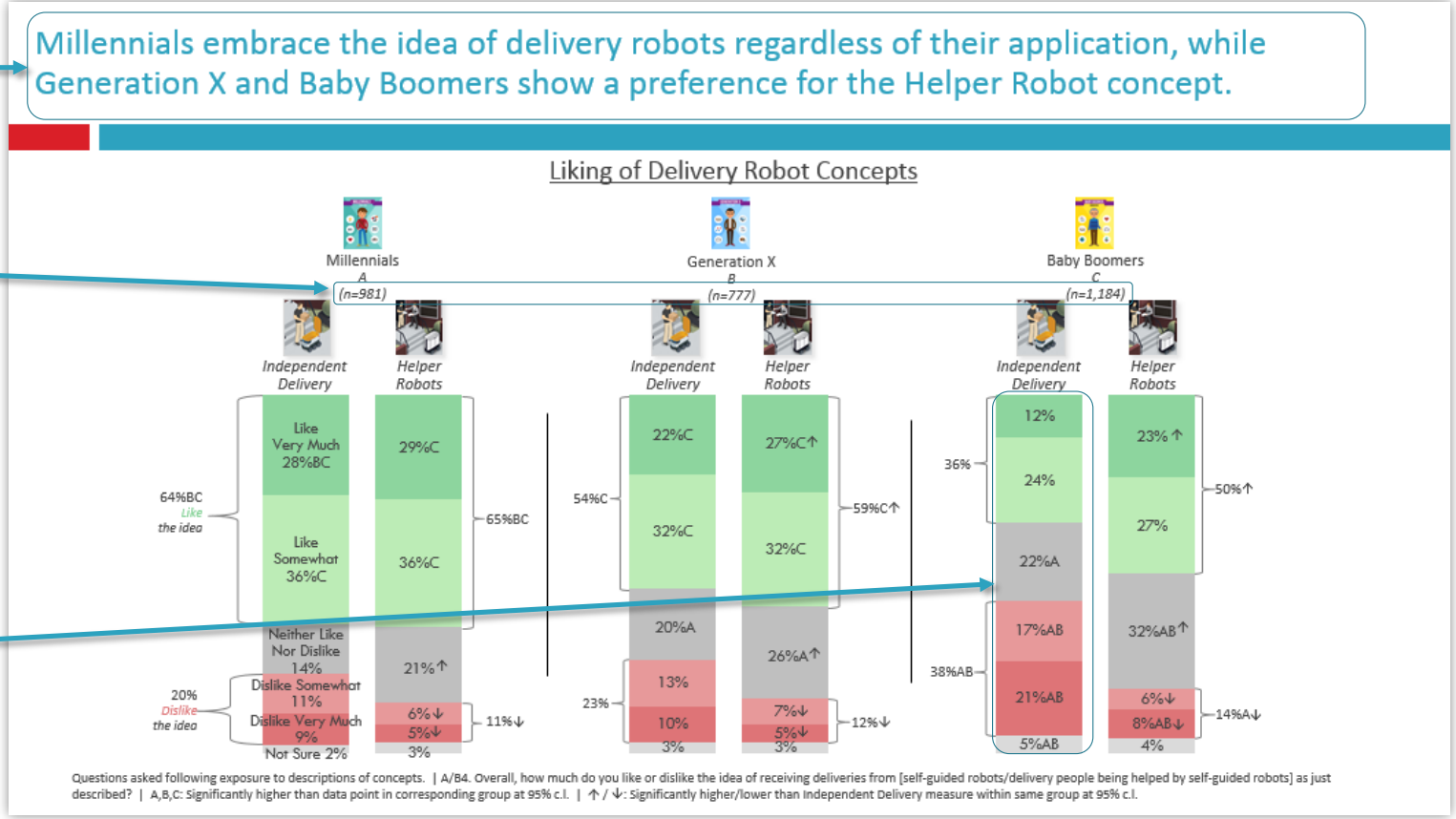

Findings presented are based on respondents slightly familiar or more with all brands at Q2. How familiar are you with the following organizations? | Questions asked following exposure to descriptions of concepts. | A12/B11. Would your overall impression of the following organizations be more or less positive if you knew that they would be using self-guided robots [for the delivery of food, mail, priority documents, or packages/to help delivery people complete their work]? | *Net Change = (More Positive – Less Positive). | A,B,C: Significantly higher than data point in corresponding group at 95% c.l. | ↑ / ↓: Significantly higher/lower than pre measure within same group at 95% c.l.

# Appendix A

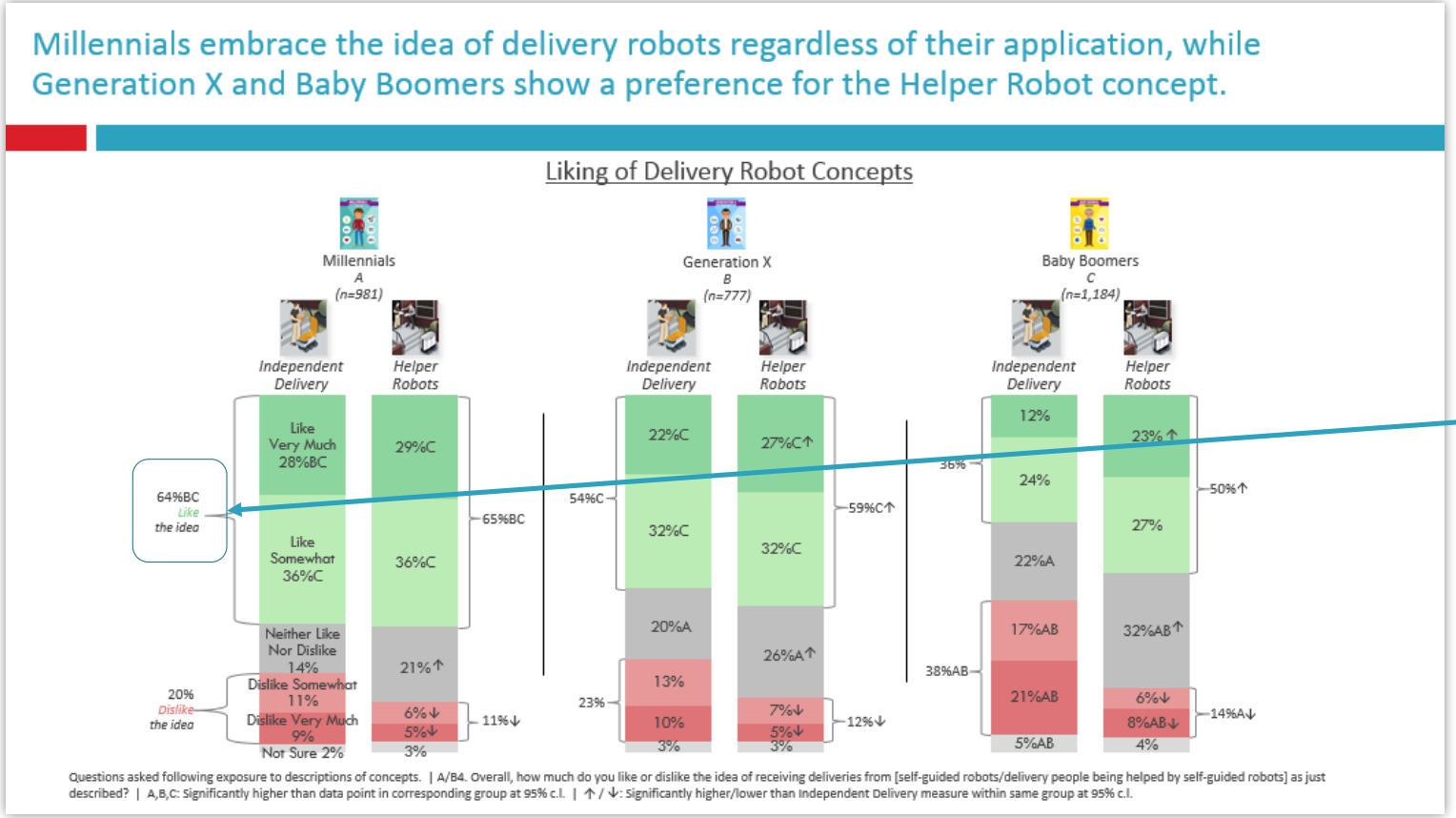
## *Guide to Interpreting the Detailed Data Visualizations in this Report*

# VISUAL ELEMENTS INCLUDED WHEN PRESENTING DETAILED DATA

- Findings are presented at the top of each slide and are written in a way that should be understandable for non-technical audiences.
- The number of respondents — shown as "(n=)" — is included for all groups.
- The numbers shown in certain charts may not add up to 100 percent, which is due to rounding.
  - *For example, the numbers presented here sum to 101 percent (12% + 24% + 22% + 17% + 21% + 5%).*



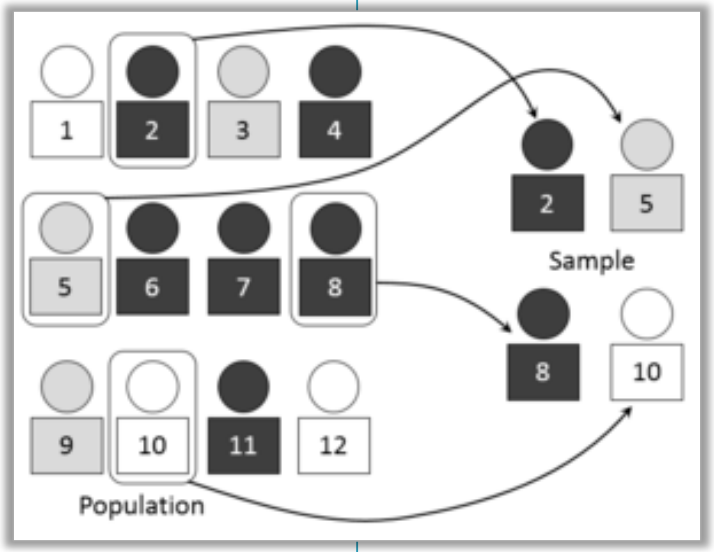
# UNDERSTANDING “NETTED” DATA




- On many slides, data are presented in “nets,” where respondents’ selection of any combination of response items within an overarching category is counted as one selection when calculating the percentage of people who selected the “netted” category.
  - *For example, the Millennials that reported that they liked the Independent Delivery concept “very much” or “somewhat” were combined here to show that 64 percent of Millennials liked the concept overall.*
- Note: Netted data is presented in several ways. It might be shown next to a bracket, as in this example slide, or the netted items might be boxed within a graph, or a net might be included on its own row at the top of a graph.

# AN OVERVIEW OF INTERPRETING STATISTICAL SIGNIFICANCE

Numbers, such as percentages, that are derived from a sample can only provide estimates of the true number that exists in a population. Differences in opinion between two reported groups might be due to random variation, or might be due to a true difference of opinion between the groups.




In order to help interpret the numbers reported from a sample, it is common to perform "statistical significance testing" to determine the probability that the difference between two percentages observed in the sample would have occurred by chance if the population proportions were equal.

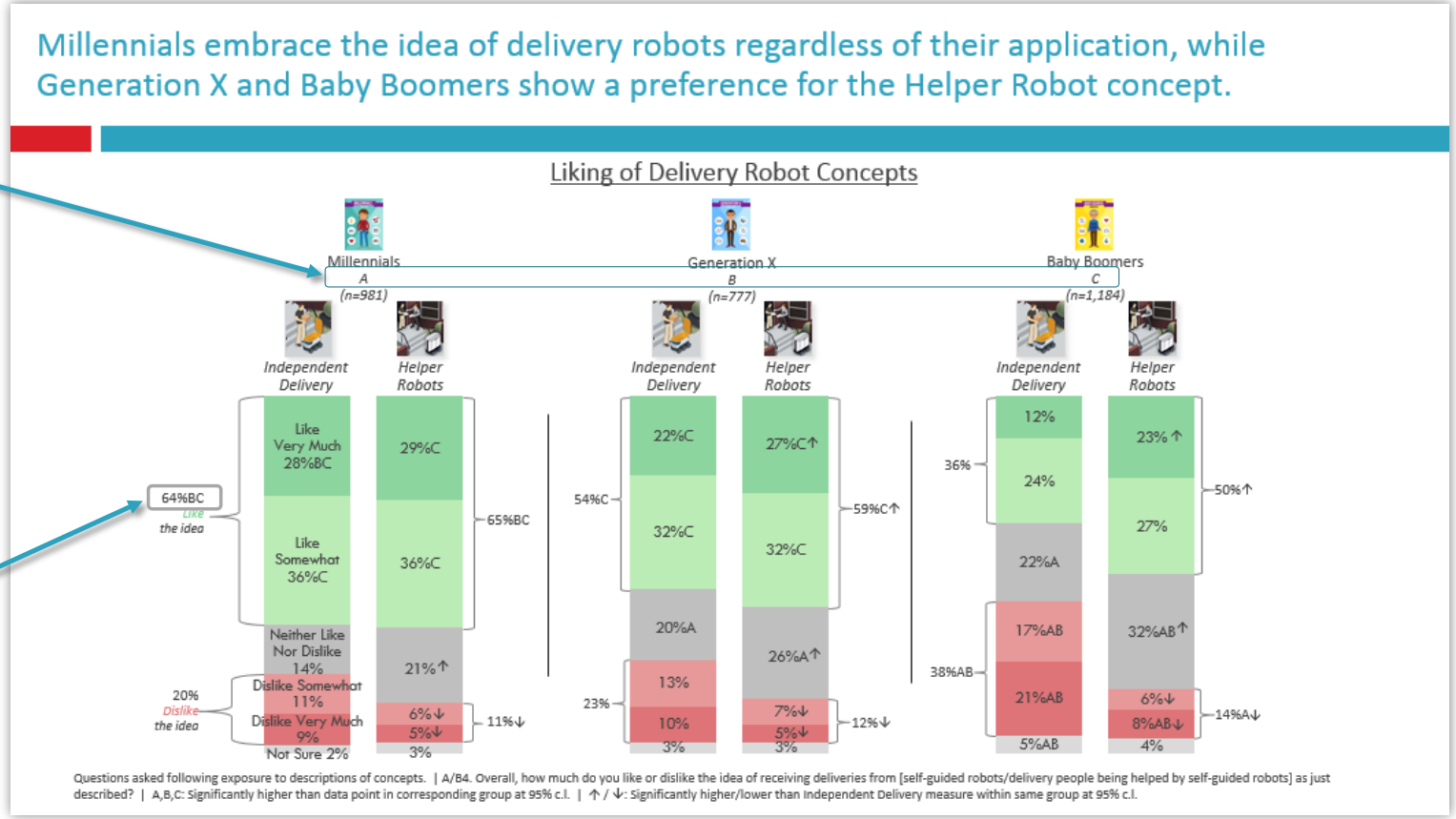
Statistical significance is calculated using "confidence levels," referred to as "c.l." throughout this report. Higher confidence levels provide analysts with greater certainty about the conclusions drawn from data. Data in this report use a 95 percent confidence level, which is commonly used in academic and government survey research.

When two numbers are different at the confidence threshold that was used, they are said to be "significantly different."

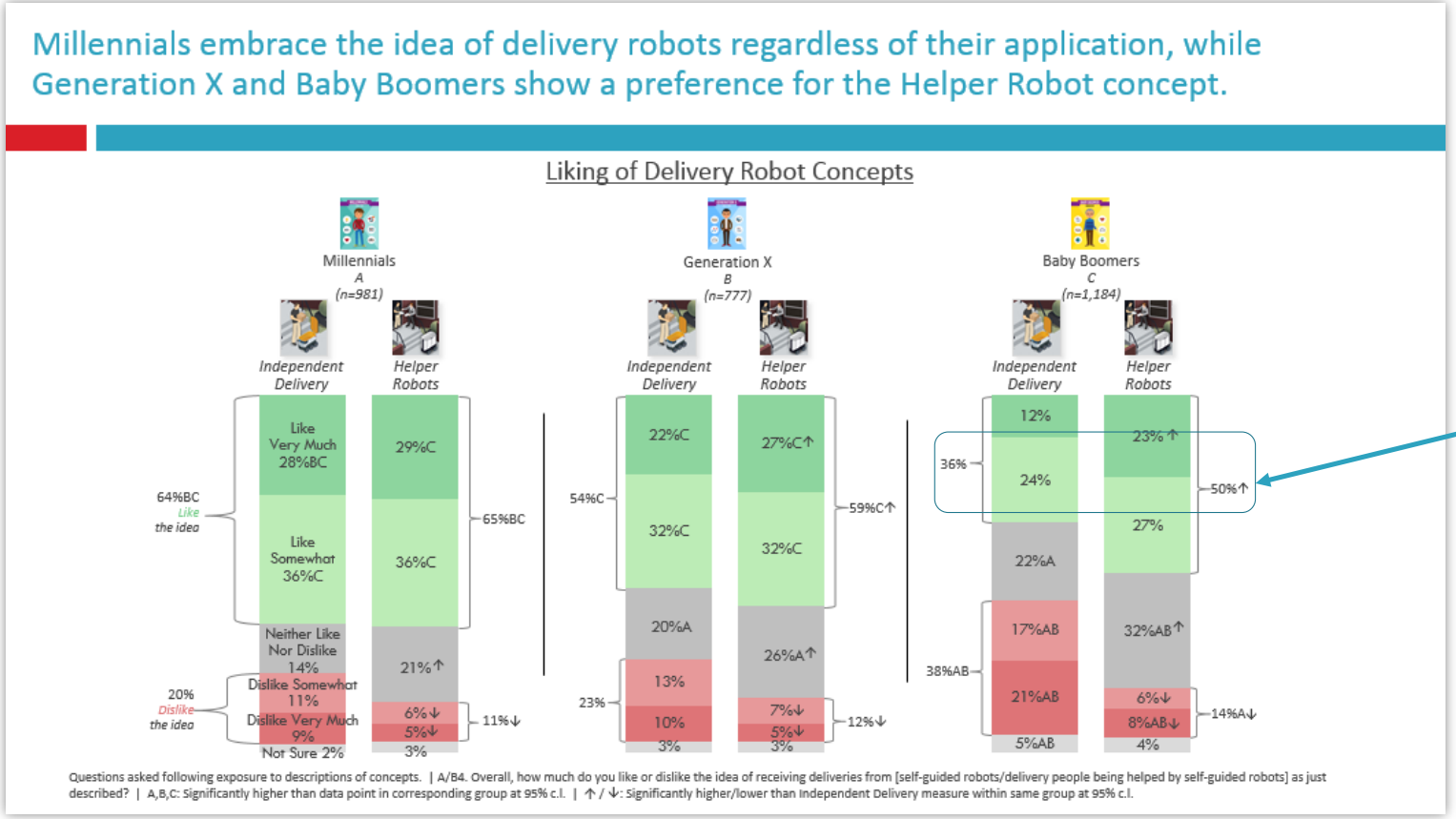
While it is still possible that the differences between two tested numbers could be due to chance, or due to the other issues that are discussed in Appendix B of this report, differences of opinion between groups whose results are "significantly different" meet a higher, more credible standard than differences that do not pass significance testing.

# UNDERSTANDING STATISTICAL SIGNIFICANCE AS REPORTED WITH LETTER NOTATION

- When tests were employed in order to determine whether the difference between two numbers was statistically significant, visual elements, such as the letter notations (A,B,C) shown in this example slide, are assigned to the groups whose results were being reported.
- In cases where the difference between two numbers is statistically significant, a letter is placed next to the larger of the two numbers.
  - *For example, the "BC" shown here indicates that the 64 percent of Millennials that like the Independent Delivery concept is "significantly higher" than the 54 percent reported among Generation X, and is also "significantly higher" than the 36 percent reported among Baby Boomers.*



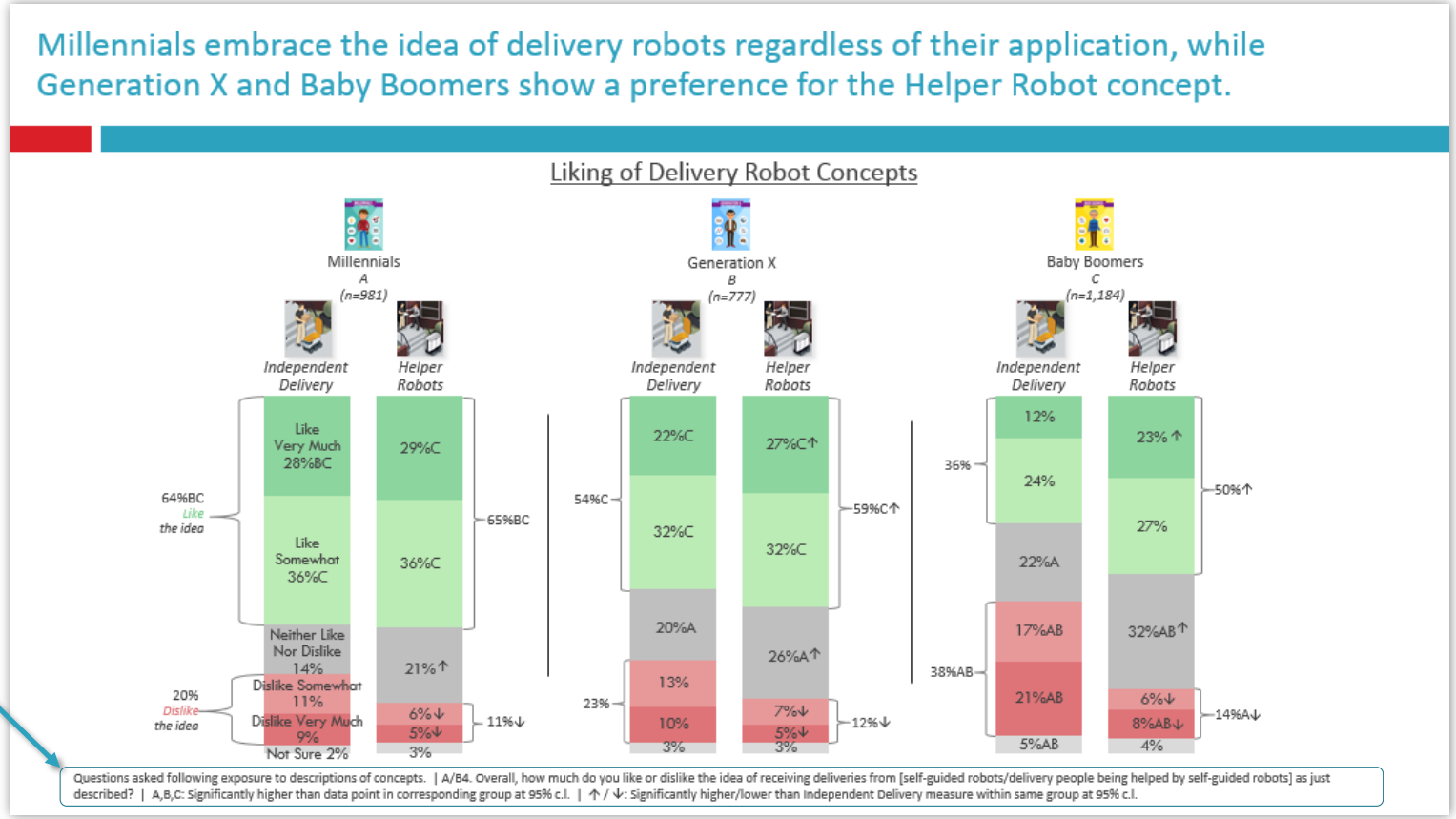
# UNDERSTANDING STATISTICAL SIGNIFICANCE AS REPORTED WITH ARROWS




- In other places, arrows (↑↓) are used to indicate statistically significant differences.
- In these cases, the direction of the arrow indicates whether the number shown is significantly higher or lower than the group against which the presented number is being tested.
  - *For example, the 50 percent of Baby Boomers that like the Helper Robots concept reported here is "significantly higher " than the 36 percent reported regarding Independent Delivery in the same group.*

# REPORT FOOTNOTES

- Footnotes are included on all data slides throughout the report. These include important details for both technical and non-technical audiences, such as complete question text, and specifications for any statistical testing performed.
    - *Footnotes are the first place to look for most of the questions that readers might have about each individual slide.*



# Appendix B

## *External Review Certification*

Chase H. Harrison Ph.D.
Somerville, MA 02143

United States Postal Service Office of Inspector General (OIG)
Risk Analysis Research Center
1735 N Lynn St
Arlington, VA 22209

February 5, 2018

To Whom It May Concern;

I certify that I have reviewed the survey methodology and reporting for the USPS OIG's paper regarding public perception of delivery robots in the United States.

I am confident that this report and its underlying methodology meet the professional standards typically employed for online opt-in market and survey research, and that researchers have provided the documentation required by the American Association for Public Opinion Research's guidelines for public disclosure.

Sincerely,

Chase H. Harrison, Ph.D.

# POINTS OF CONTACT

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