

# MOVING TOWARDS

## R o u n d a b o u t s i n C a l i f o r n i a

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# OUR TEAM

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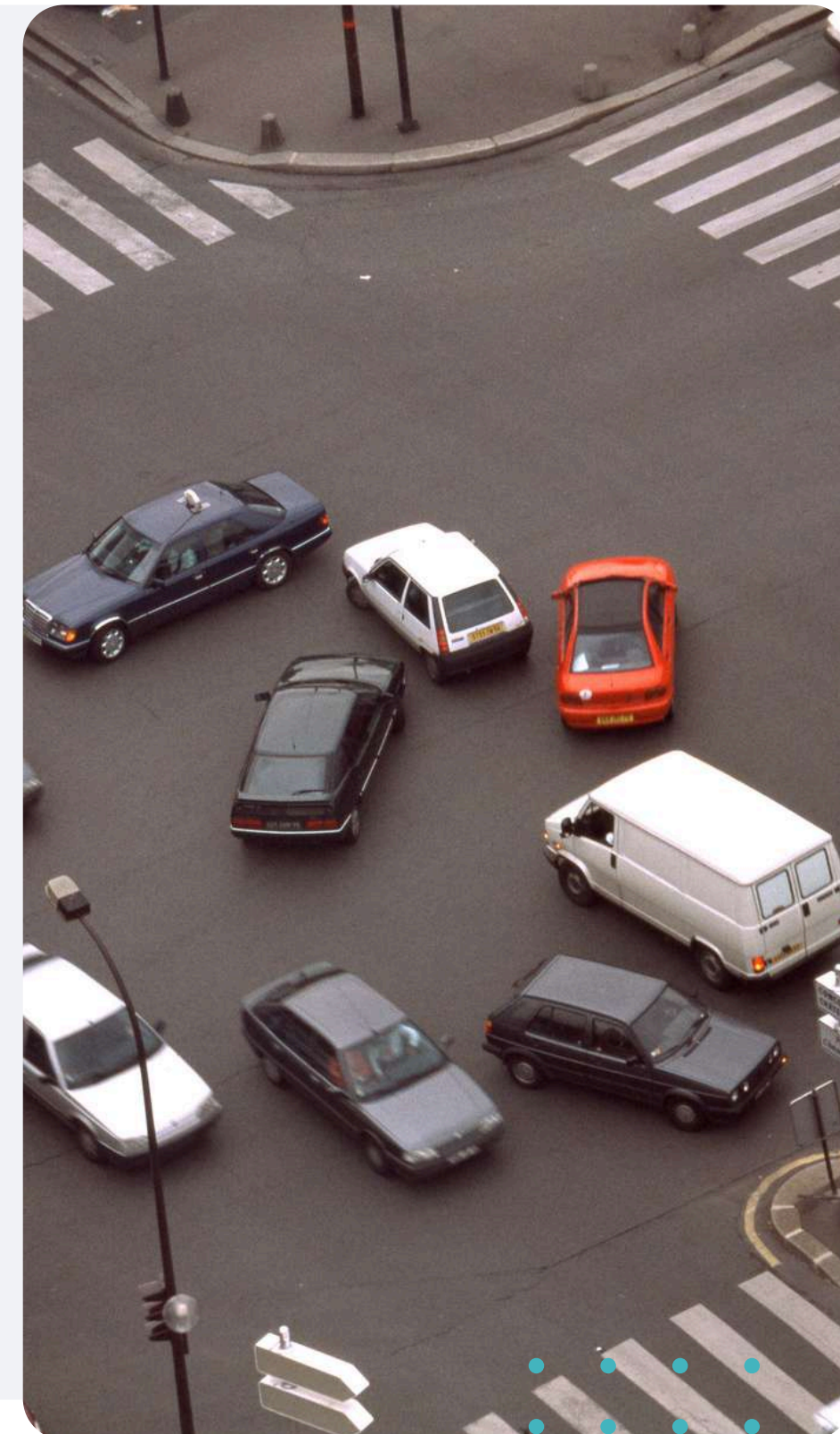
PROJECT BACKGROUND

Roundabouts are widely used globally and have proven benefits:

- Reduced delay and congestion
- Increased safety
- Lower emissions
- etc

In the US, there is still strong resistance.

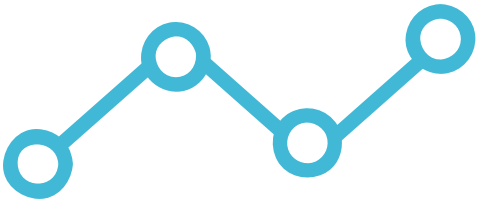
- Communities often believe roundabouts are confusing.
- Many also feel they do not improve safety or traffic conditions.
- These concerns can delay or stop proposed projects.



## Data Analysis

### Objective 1

Examine the impact in California and Central Valley before and after roundabout construction.

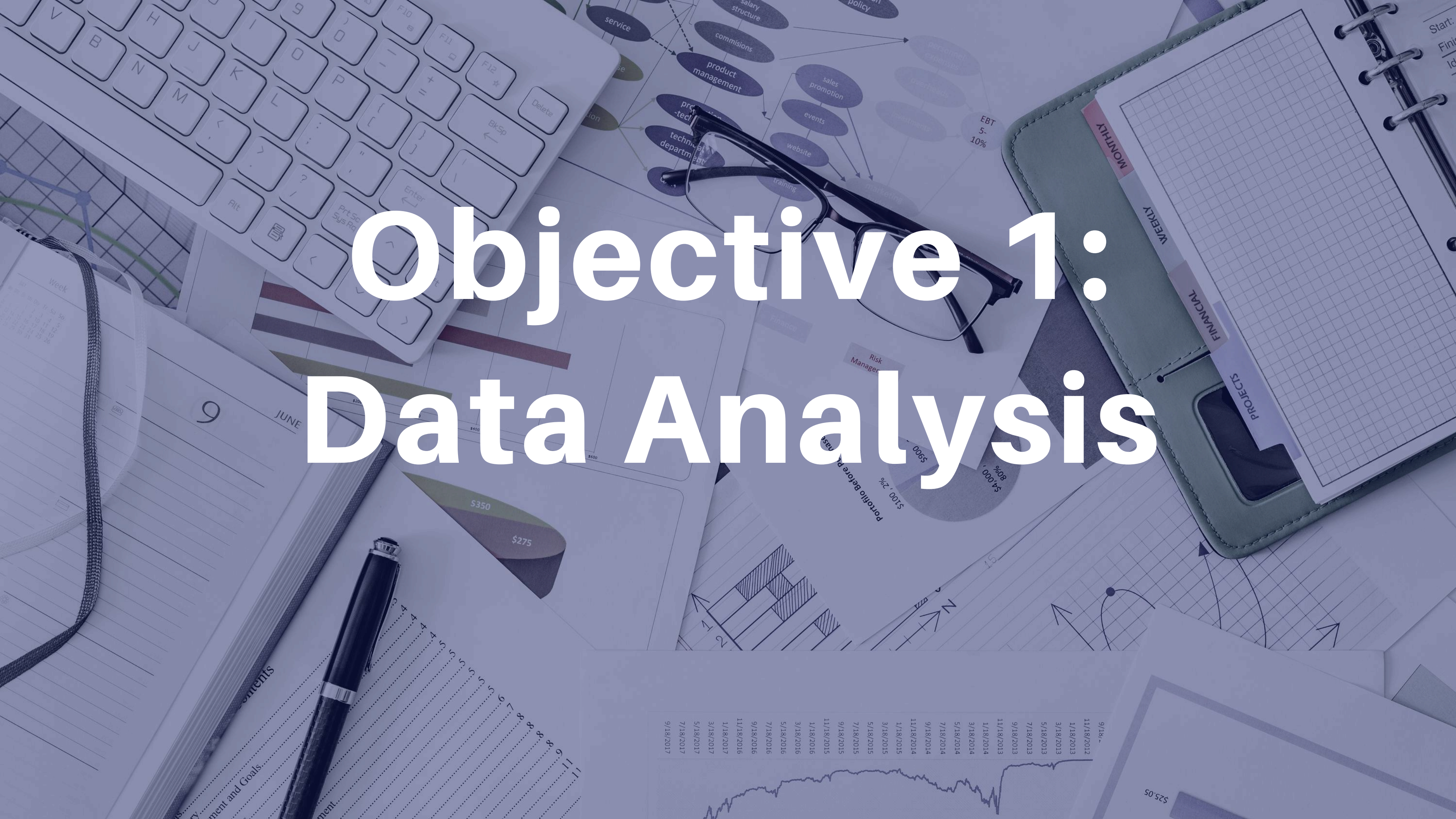


### Objective 2

Investigate public and nearby business sentiments towards roundabouts, and develop suitable messaging strategies

## Perception & Messaging





# Objective 1: Data Analysis

METHODOLOGY

3. SAFETY DATA ANALYSIS

- Geospatial Mapping & Analysis
- Database Queries
- Advanced Geospatial & Queries

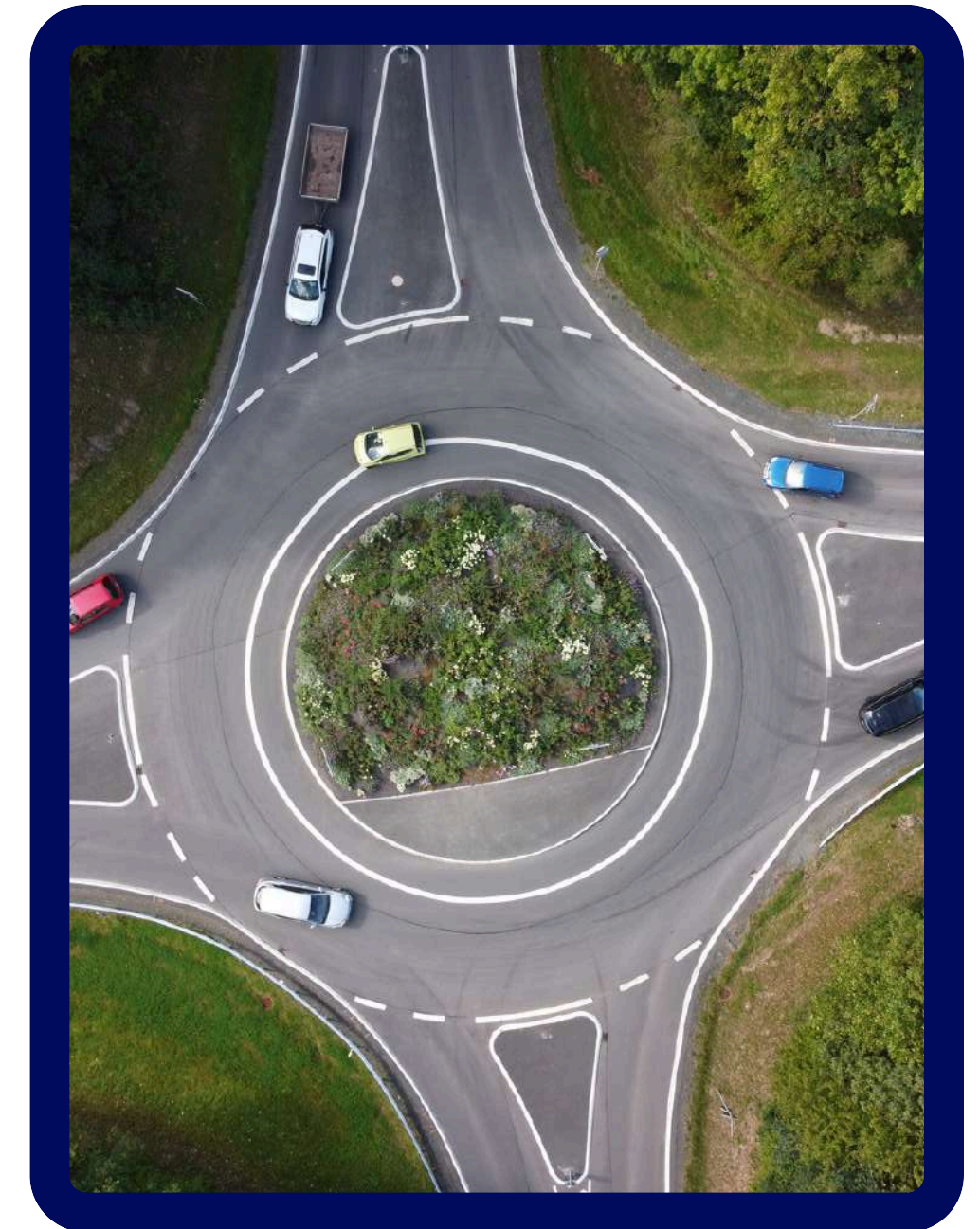
Data Preparation

- Data Acquisition
- Data Validation
- Data Cleaning
- Data Processing & Formatting

Geo Spatial Analysis

Results

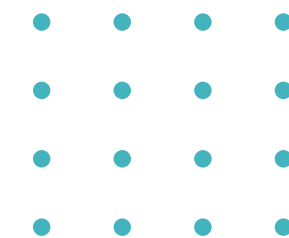
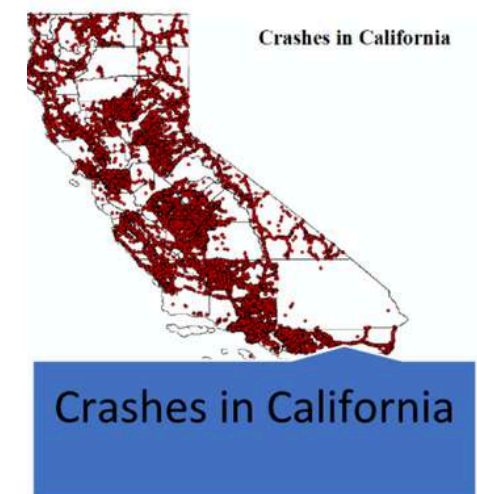
- Party Size Crashes
- DUI & Sober Crashes
- Crashes by Modes
  - Bicyclists
  - Pedestrians
  - Motorcyclists
  - Trucks
  - Motorists



Data Location	Variable Name	Description
Kittelson's Roundabout File	Street_Name	Name of the Roundabout
	YearCompleted	The year the round about was built
	Long	The longitude of the location
	Lat	The latitude of the location
Tims Data File	COLLISION_SEVERITY	The injury level of severity of the collision: 1 - Fatal injury 2 - Suspected serious injury or severe injury 3 - Suspected minor injury or visible injury 4 - Possible injury or complaint of pain
	NUMBER_KILLED	Count of victims killed in collision
	NUMBER_INJURED	Count of victims injured in collision
	County	County name where the collision occurred
	City	City name where the collision occurred
	Point_X	The longitude of the geocoded location
	Point_Y	The latitude of the geocoded location

# Data & Variables

1. Kittelson's Roundabouts data in California.
2. Transportation Injury Mapping System (TIMS) crash data from 2009-2022
  - o Is geo-coded by SafeTREC, making it easier to map crashes.



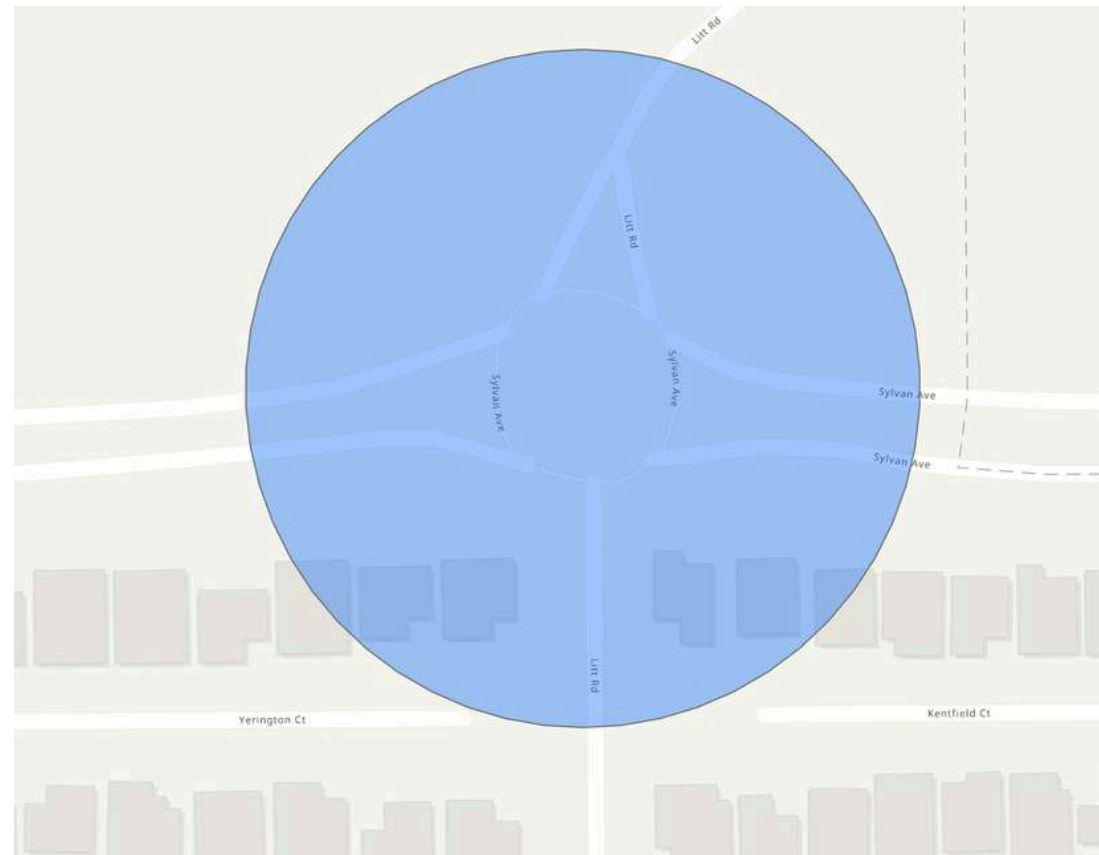
# Data Preparation

3. SAFETY DATA ANALYSIS

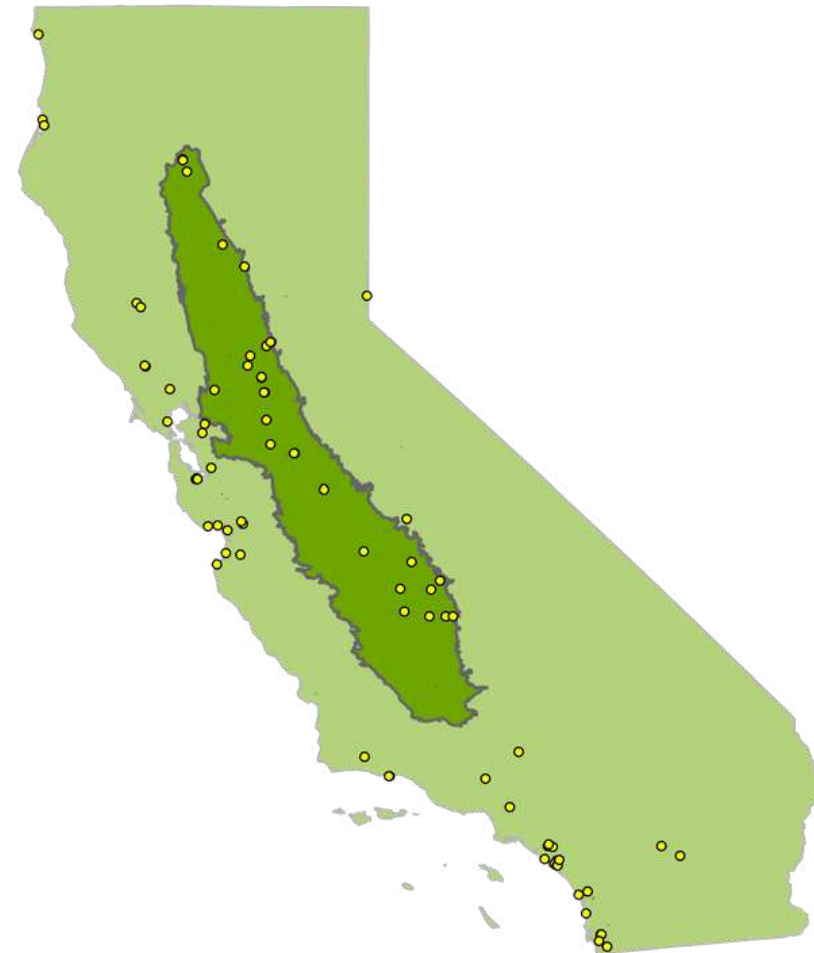


# Data Preparation

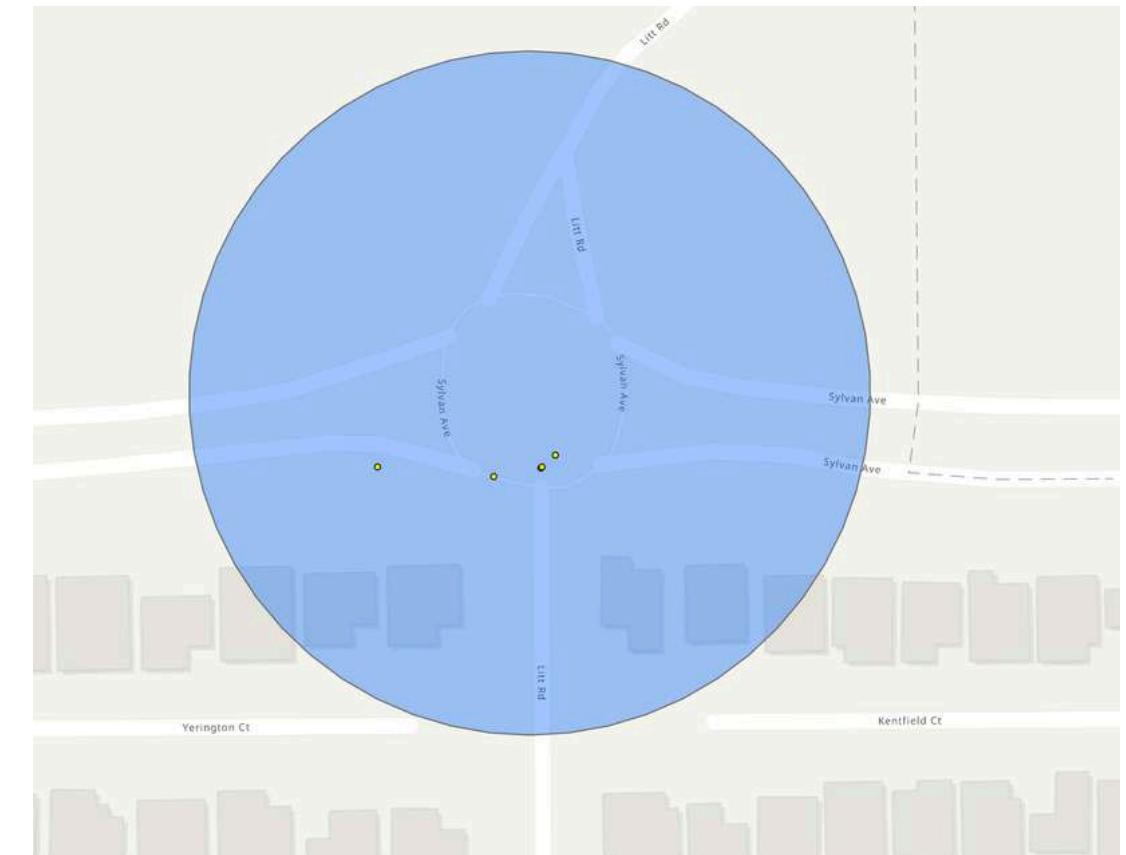
3. SAFETY DATA ANALYSIS



**CREATE ROUNDABOUT  
BUFFERS  
(100 & 250 FEET)**



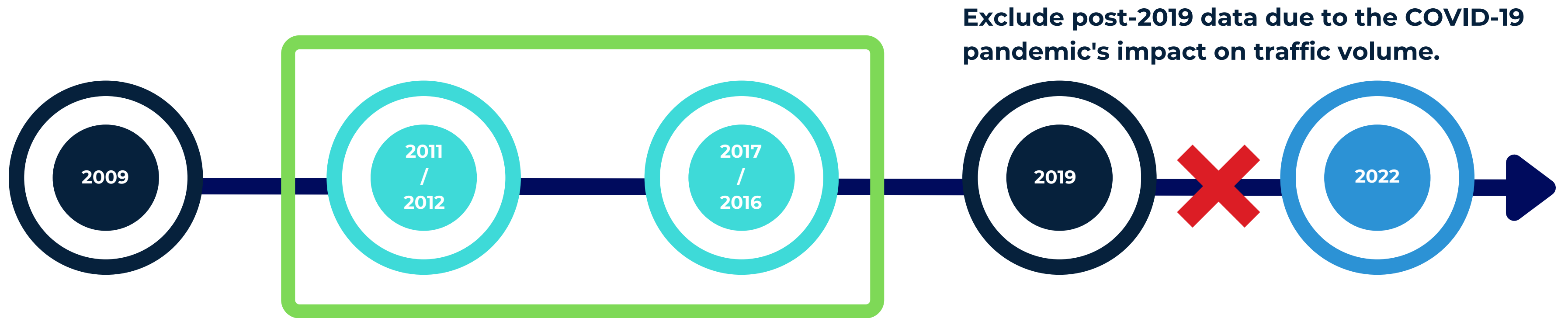
**INTERSECT CRASH  
WITH BUFFER**



**A CLOSER  
INSPECTION**

# Data Time Frame

3. SAFETY DATA ANALYSIS



The analysis will be based on the roundabouts constructed between 2 methods

- (Method 1, 3-year of crash data before & after roundabout construction) 2011 - 2017
- (Method 2, 2-year of crash data before & after roundabout construction) 2012 - 2016

# Formulas

- Crashes per year before construction =  $\frac{N_b}{y - \alpha}$

Where  $N_b$  = Number of crashes before construction

$y$  = Year of Construction of Roundabout

$\alpha$  = Year of first recorded Crash (i.e., 2011)

- Crashes per year after construction =  $\frac{N_a}{\beta - y}$

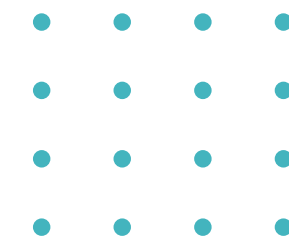
Where  $N_a$  = Number of crashes after construction

$y$  = Year of Construction of Roundabout

$\beta$  = Year of last recorded Crash (i.e., 2019)

	A	B	C	D	E	F	G	H
1	Roundabout Name	Year constructed	Crashes Before	Years Before	Crash rate before	Crashes After	Years After	Crash rate after
2	Aptos Beach Dr. / Esplanade / Beach Dr. / Rio Del Mar Blvd. / Venetian Rd.	2015	9	4	2.25	7	4	1.75
3	Arnold Dr. / Agua Caliente Rd.	2013	3	2	1.50	7	6	1.17
4	Ashby Rd. / Gurr Rd.	2016	3	5	0.60	0	3	0.00
5	Avenue of the States / California Dr. / Michigan Dr.	2016	2	5	0.40	0	3	0.00
6	Camino de los Mares / Camino del Rio / Bonanza	2017	8	6	1.33	10	2	5.00
7	Camino del Rio / Calle Sarmentoso	2017	0	6	0.00	2	2	1.00
8	Campus Dr. / Bowdoin St.	2015	0	4	0.00	2	4	0.50
9	Campus Dr. / Escondido Rd.	2014	7	3	2.33	3	5	0.60
10	Campus Dr. / Galvez St.	2016	3	5	0.60	0	3	0.00
11	Campus Dr. / Santa Teresa St.	2015	0	4	0.00	4	4	1.00
12	Civic Center Dr. / Peter Behr Dr.	2016	3	5	0.60	0	3	0.00
13	Cliff Dr. / Las Positas Rd.	2017	15	6	2.50	6	2	3.00
14	Clifford Ave. / Pennsylvania Dr.	2014	12	3	4.00	4	5	0.80
15	D Ave. / E 12th St. / Kimball Way	2016	15	5	3.00	4	3	1.33
16	Del Monte Blvd. / Beach Rd.	2017	29	6	4.83	2	2	1.00
17	E 3rd St. / N Bush St.	2016	3	5	0.60	3	3	1.00
18	E Alisal St. / Quilla St. / Skyway Blvd.	2016	8	5	1.60	3	3	1.00
19	E Avenue L / Challenger Way	2016	52	5	10.40	8	3	2.67
20	Eisenhower Dr. / Calle Sinaloa	2014	0	3	0.00	4	5	0.80
21	El Camino del Mar / Catalina St. / Los Robles	2015	3	4	0.75	0	4	0.00
22	Factory Outlets Dr. / I-5 NB Ramps / Locust St. / Deschutes Rd.	2013	0	2	0.00	4	6	0.67
23	First St. / Second St. / Camelia Way	2013	3	2	1.50	9	6	1.50

Data Chart



QUANTITATIVE CRASH RESULTS | ALL MODES

Mode-specific and severity results were analyzed, but only overall results are shown in this presentation

- Motorists
- Pedestrians
- Motorcyclists
- Cyclists
- Trucks

3. SAFETY DATA ANALYSIS

California												
	Buffer	Roundabout Year Built	Fatal				Crash		Injury			
			Incident		Individuals		Count	% Change	Incident		Individuals	
			Count	% Change	Count	% Change			Count	% Change	Count	% Change
Method 1	100	2011 - 2017	11	-52%	14	-43%	394	10%	390	10%	533	-16%
	250		15	-68%	20	-65%	577	1%	562	1%	789	-23%
Method 2	100	2012-2016	7	-45%	8	-15%	263	2%	259	2%	350	-22%
	250		10	-65%	13	-56%	385	-15%	380	-15%	531	-35%

**Incident:**

a single crash event

**Individuals:**

the people involved in that crash event

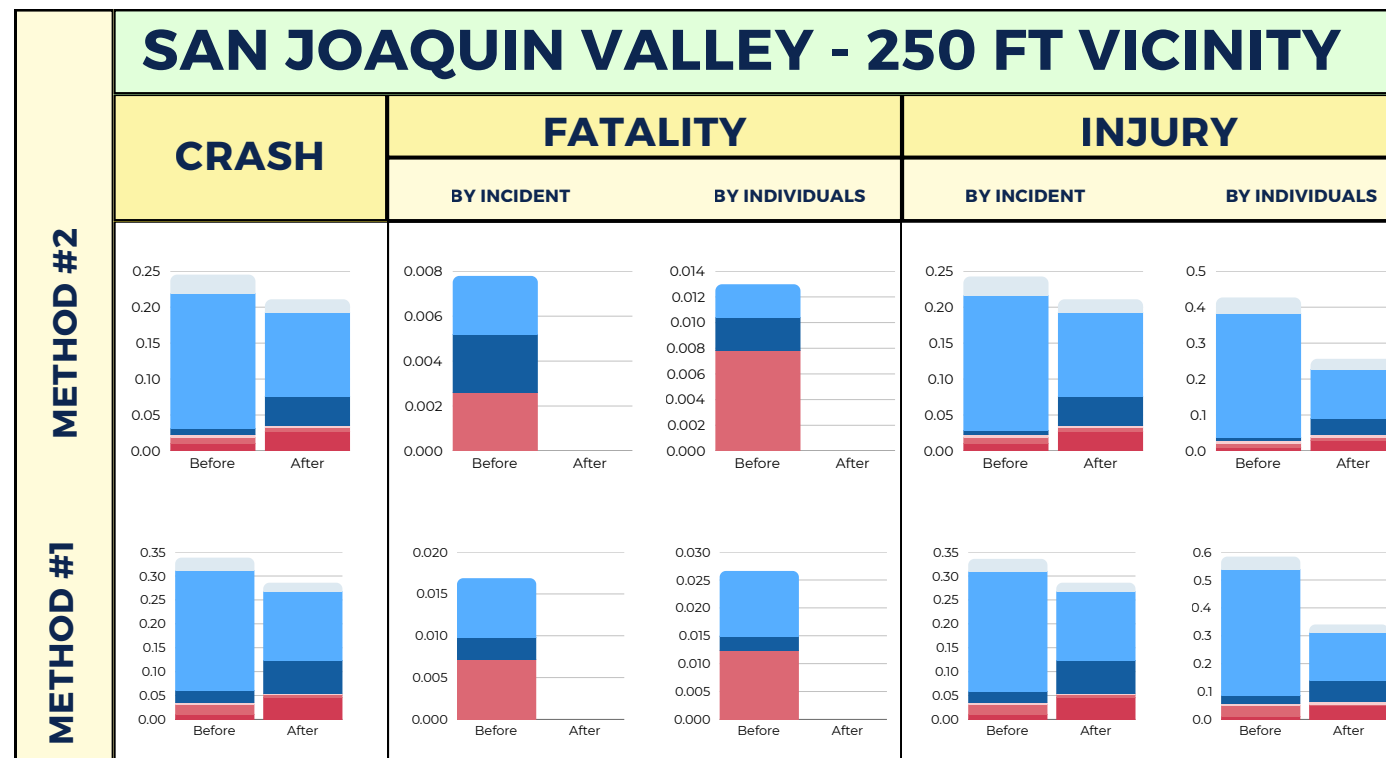
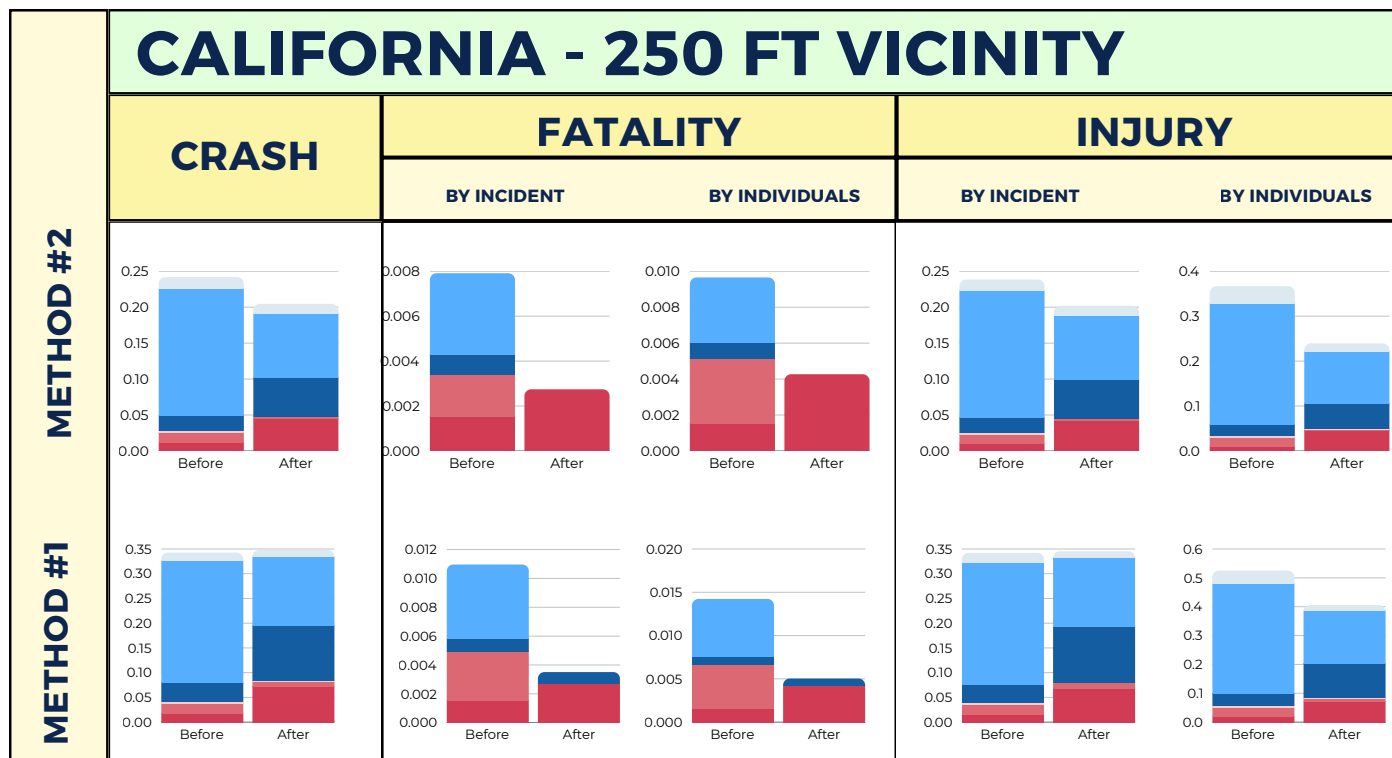
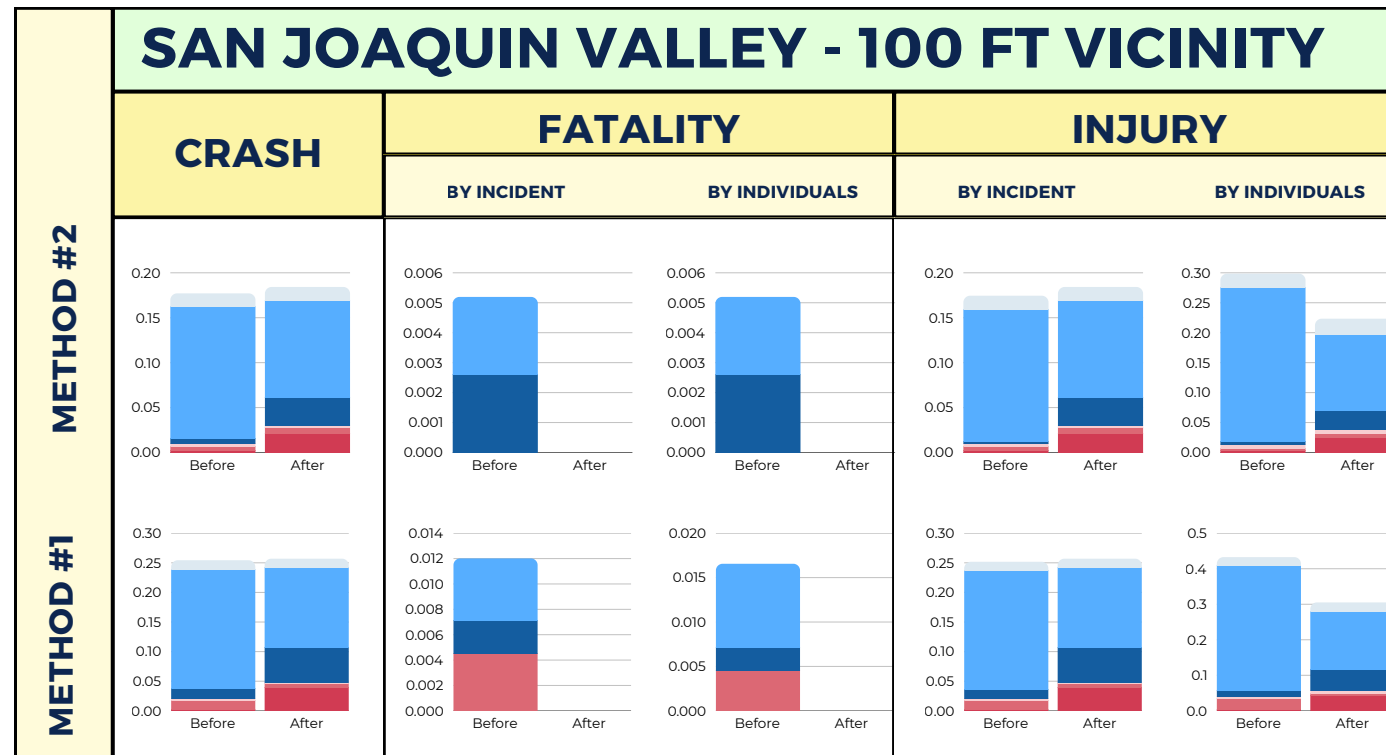
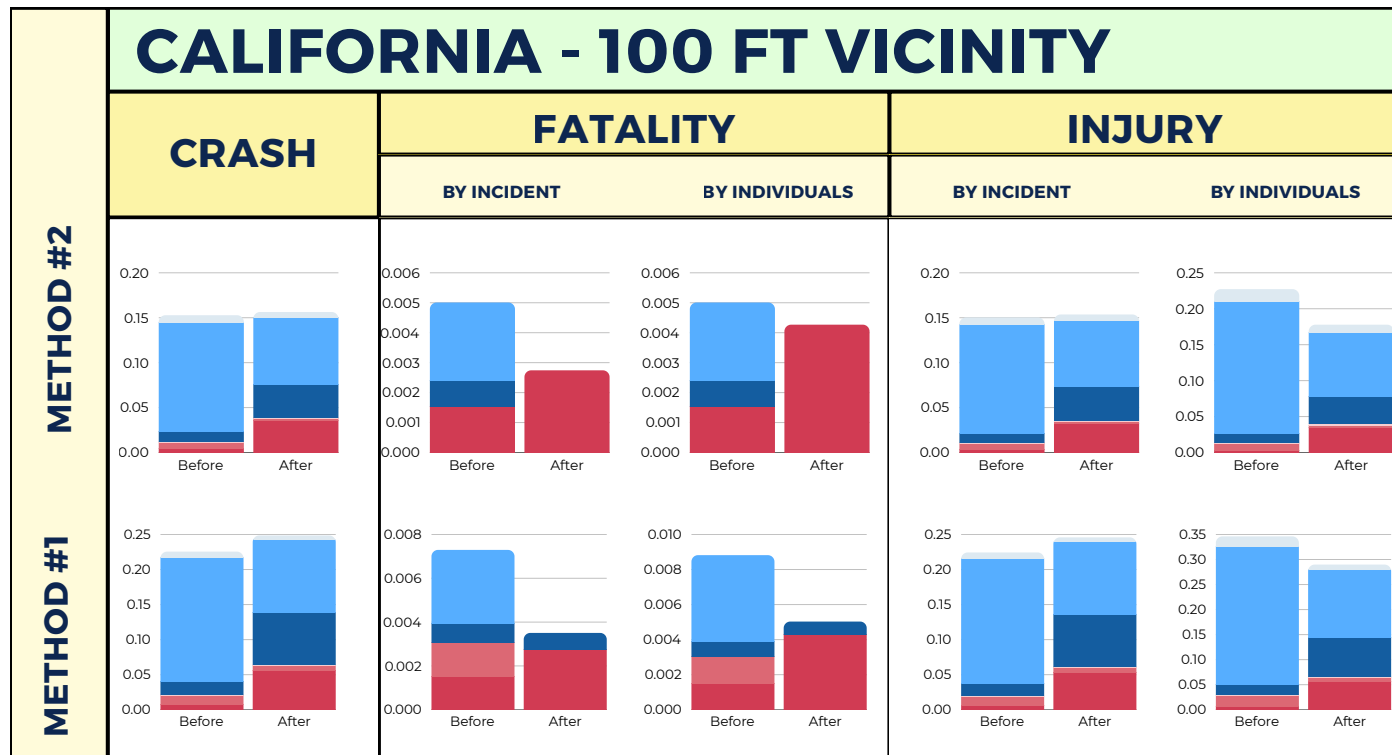
San Joaquin Valley												
	Buffer	Roundabout Year Built	Fatal				Crash		Injury			
			Incident		Individuals		Count	% Change	Incident		Individuals	
			Count	% Change	Count	% Change			Count	% Change	Count	% Change
Method 1	100	2011 - 2017	5	-100%	7	-100%	147	1%	146	2%	217	-29%
	250		7	-100%	11	-100%	185	-16%	184	-15%	282	-42%
Method 2	100	2012-2016	2	-100%	2	-100%	105	4%	104	6%	149	-25%
	250		3	-65%	5	-100%	135	-14%	134	-13%	203	-40%

**Crashes:**

the total number of crash events recorded overall

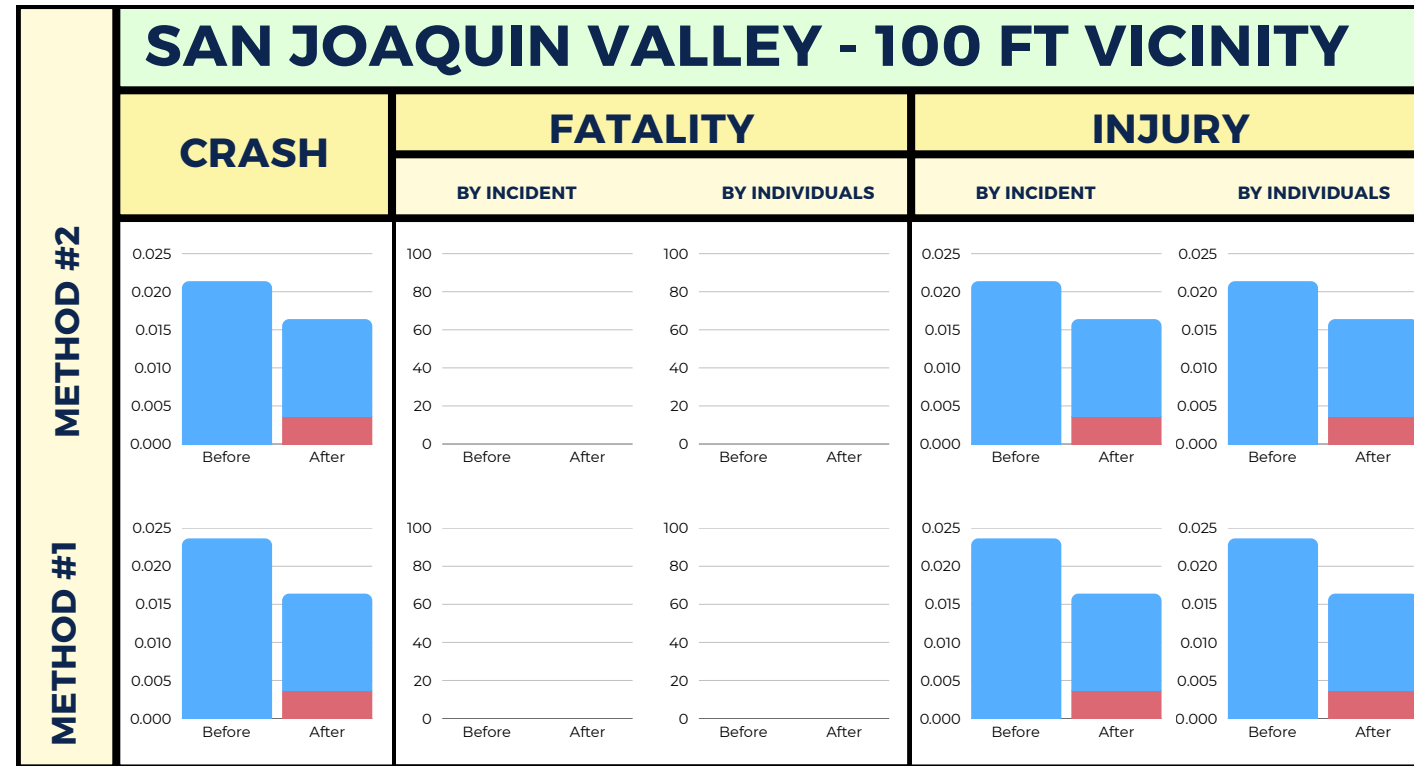
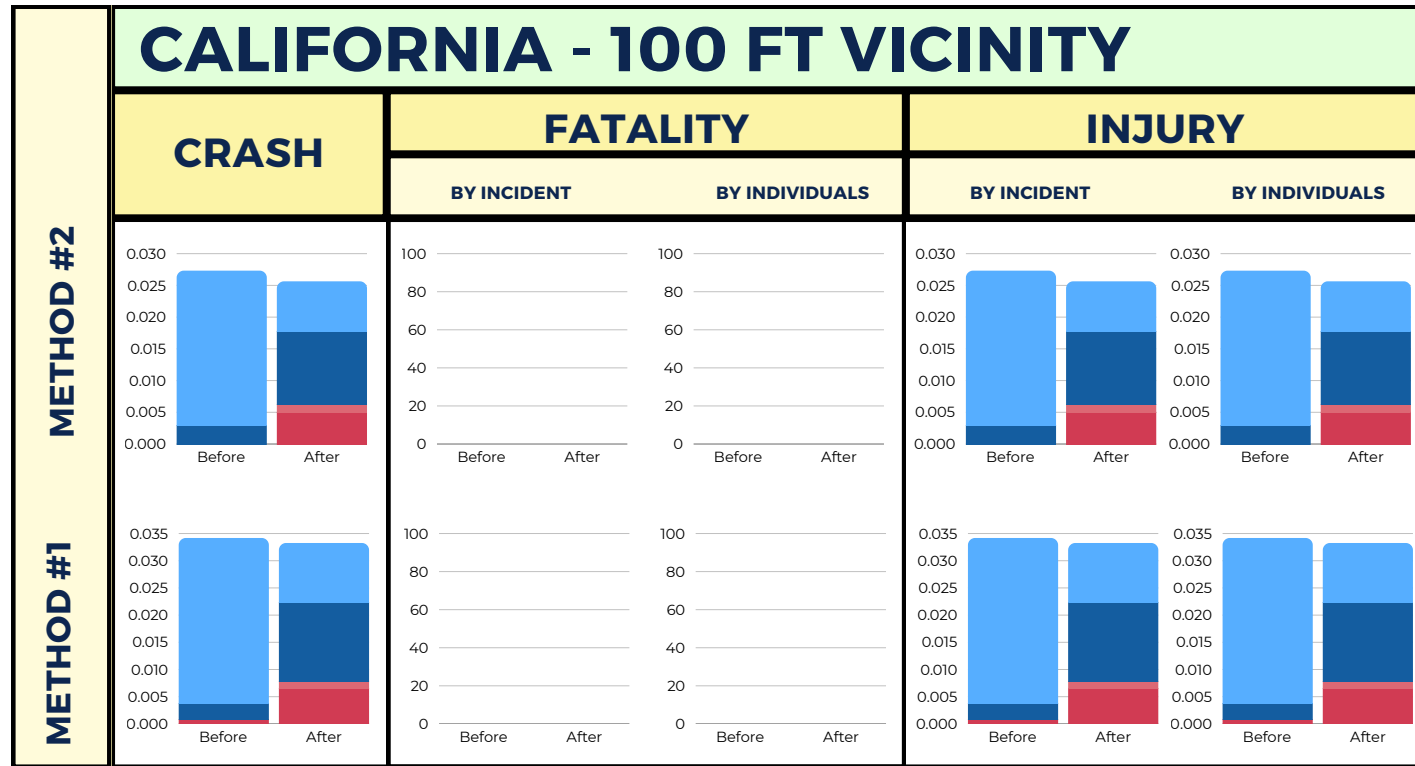
3. SAFETY DATA ANALYSIS

QUANTITATIVE CRASH RESULTS | ALL MODES



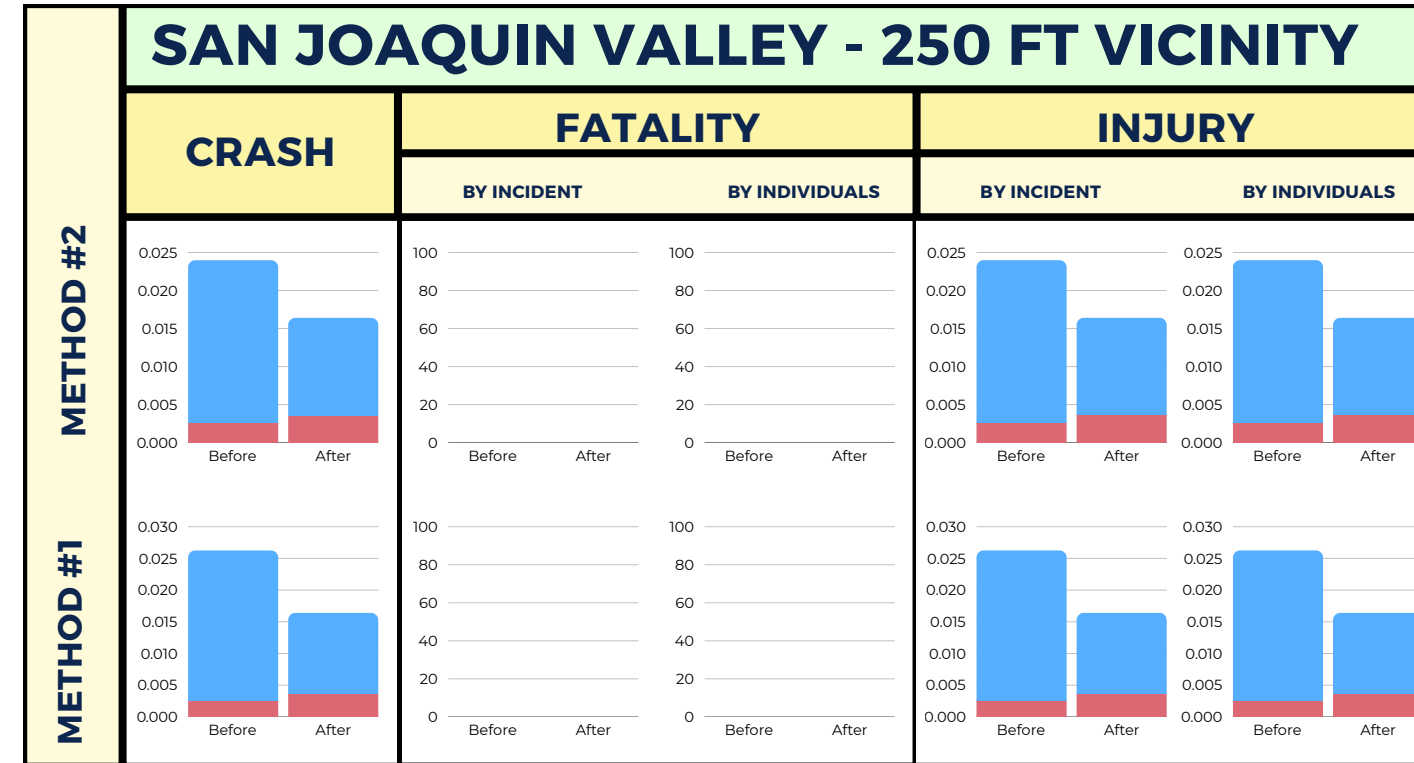
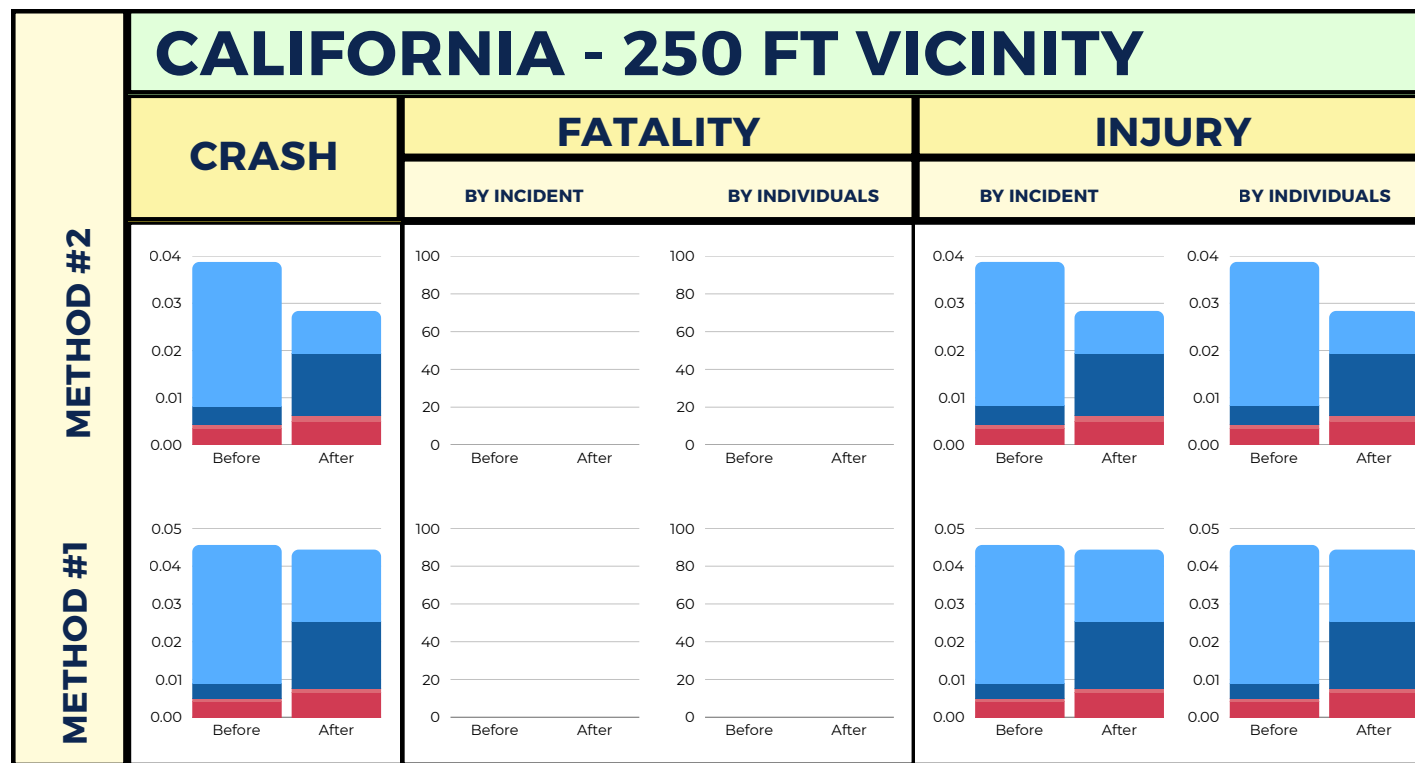
QUANTITATIVE CRASH RESULTS | BICYCLISTS

3. SAFETY DATA ANALYSIS



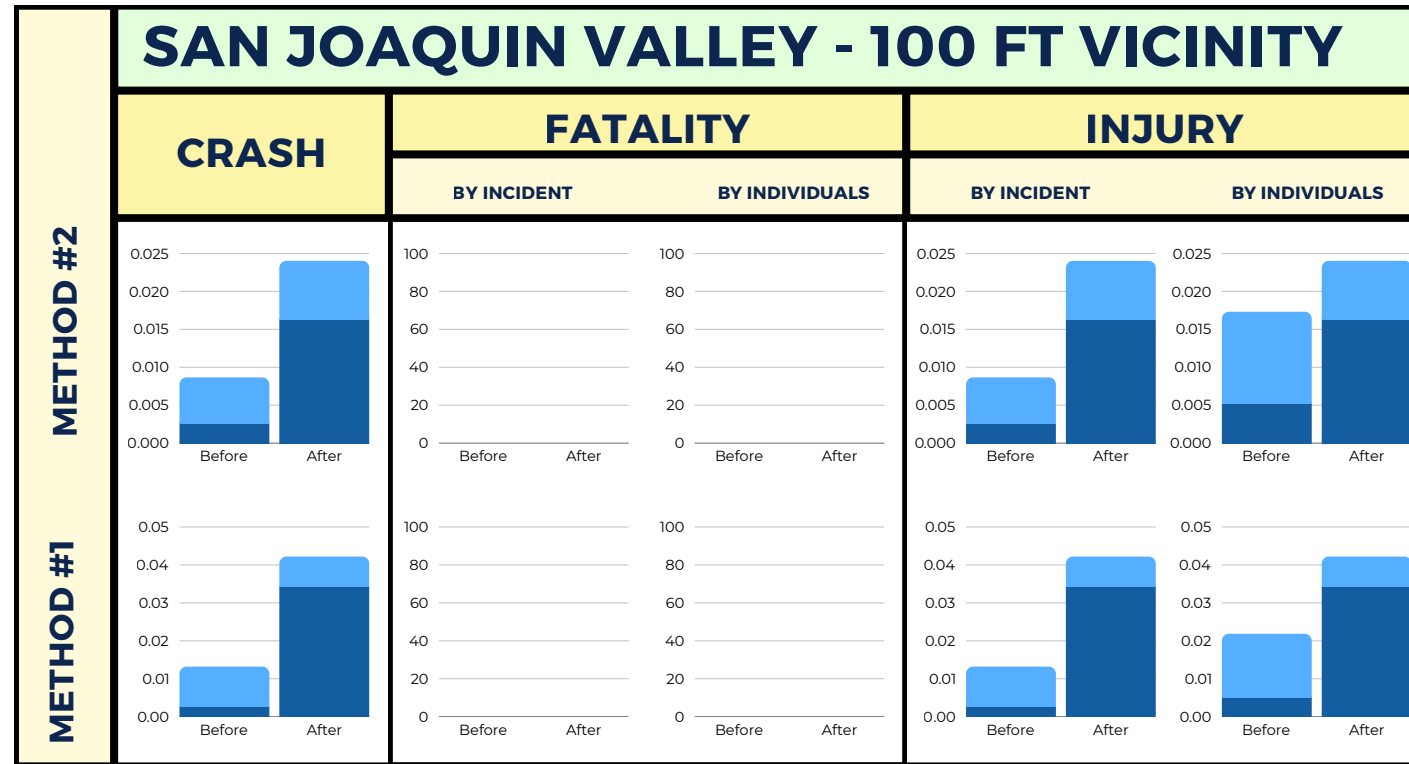
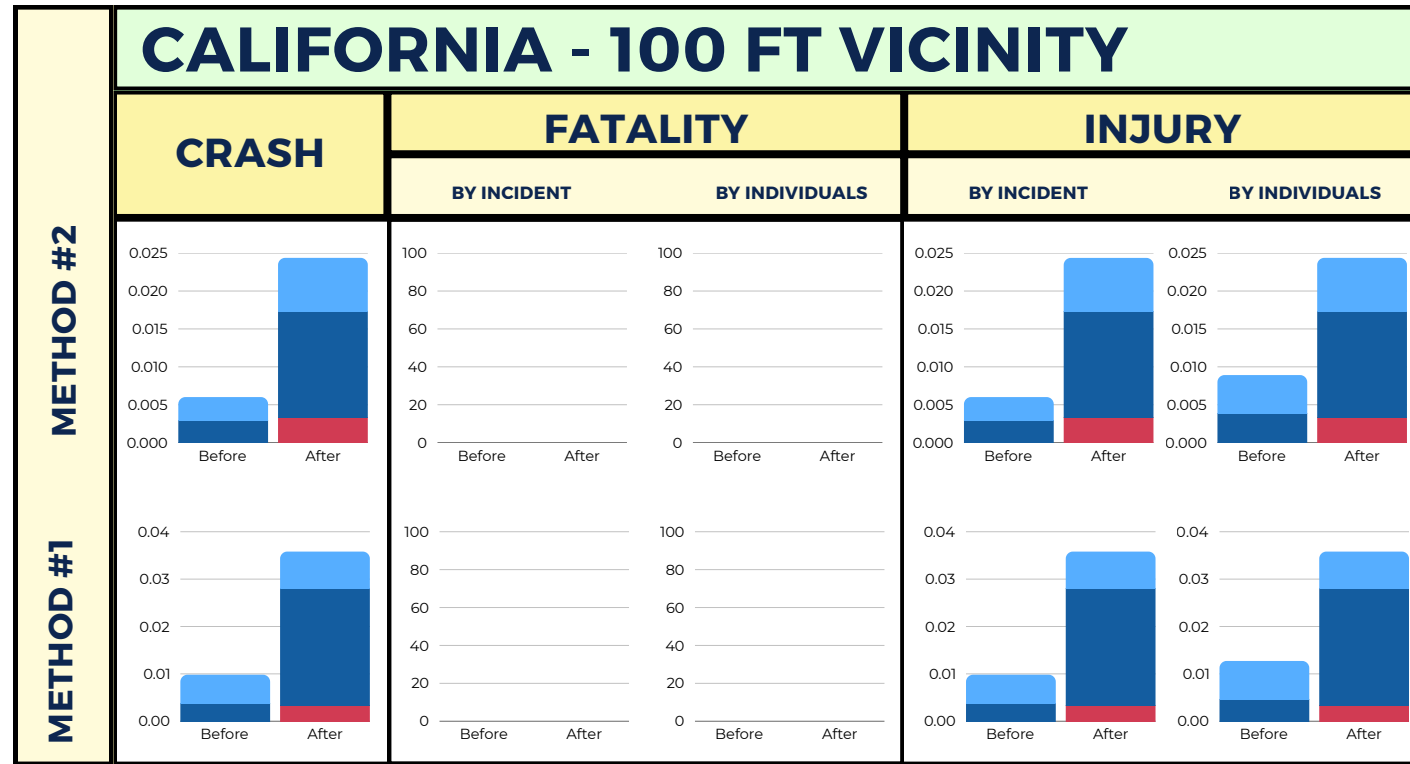
#### KEY

- Non-DUI 3+ party
- Non-DUI 2 party
- Non-DUI 1 party
- DUI 3+ party
- DUI 2 party
- DUI 1 party







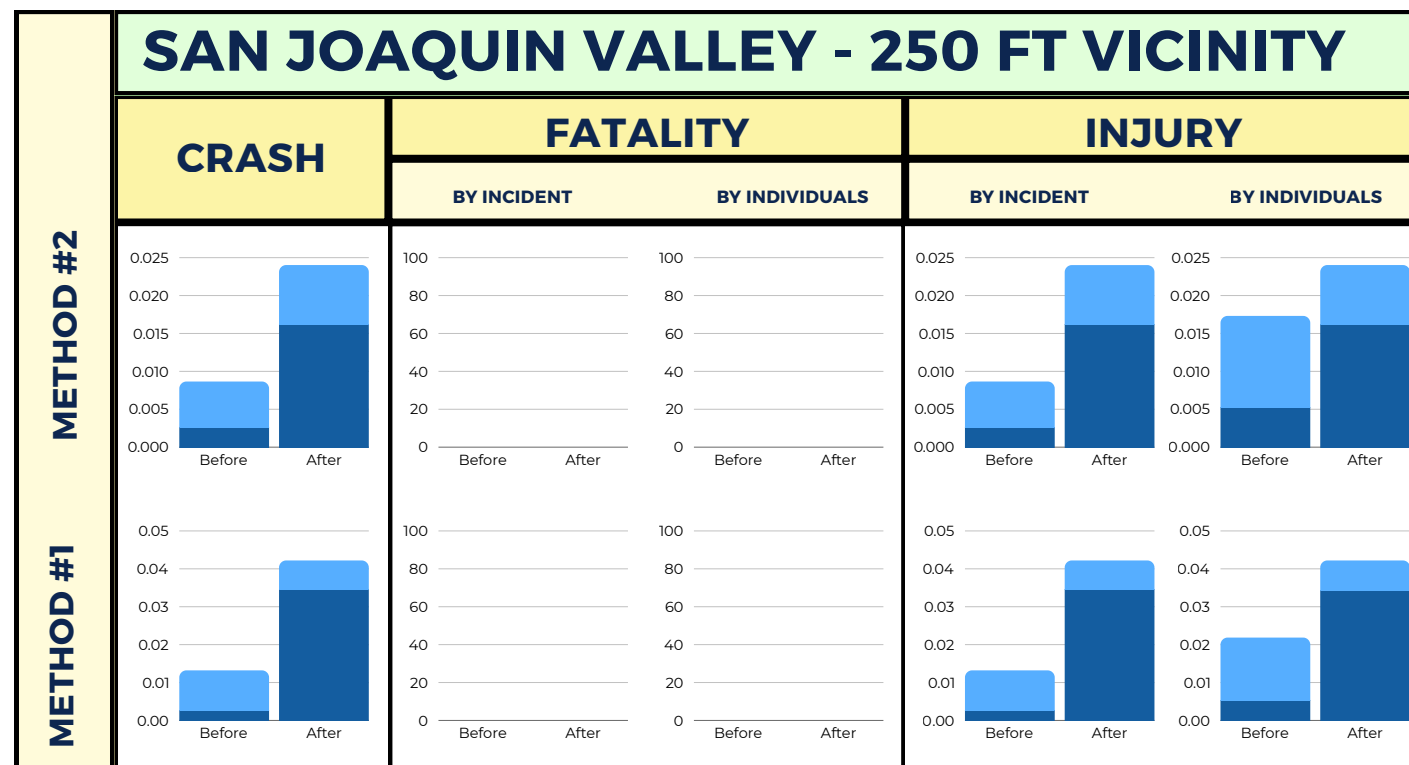
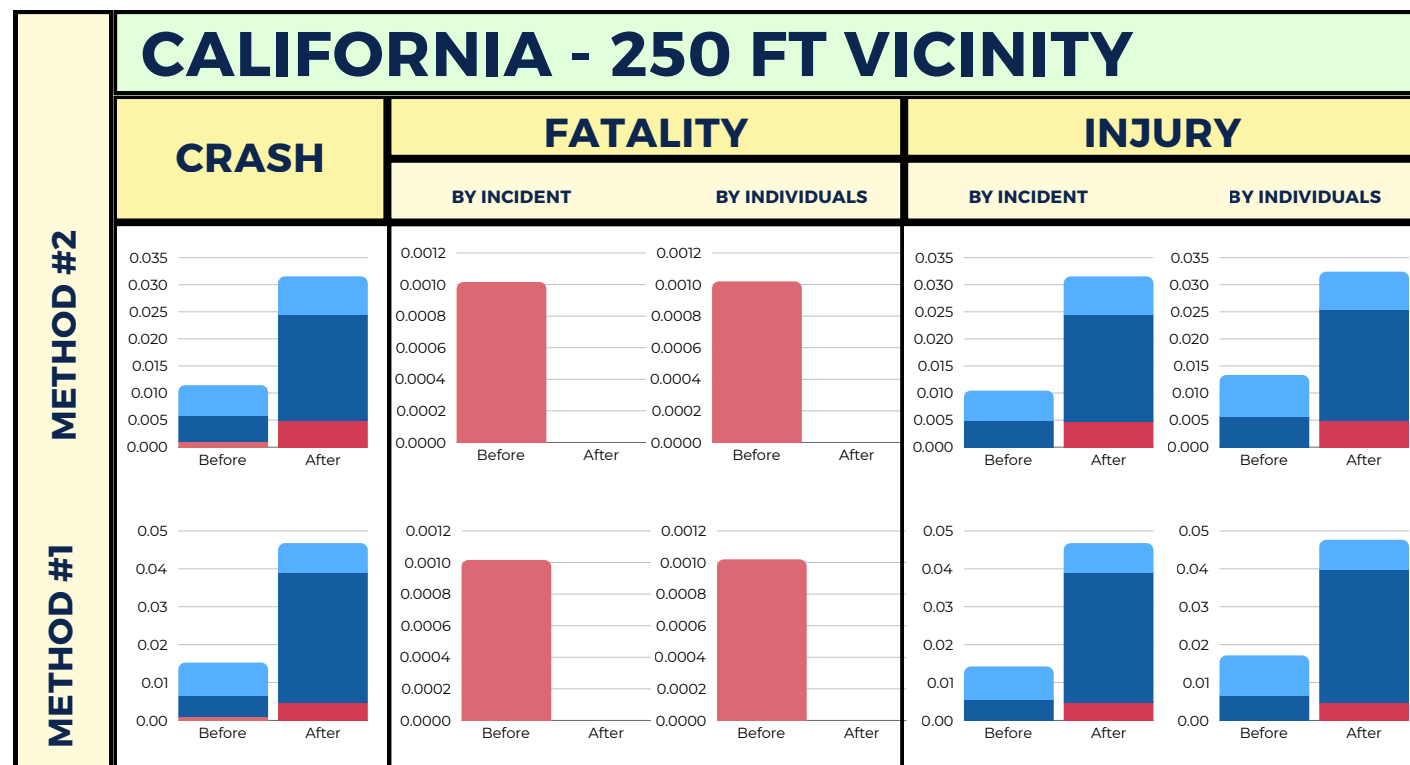

**QUANTITATIVE CRASH RESULTS | MOTORCYCLISTS**

3. SAFETY DATA ANALYSIS

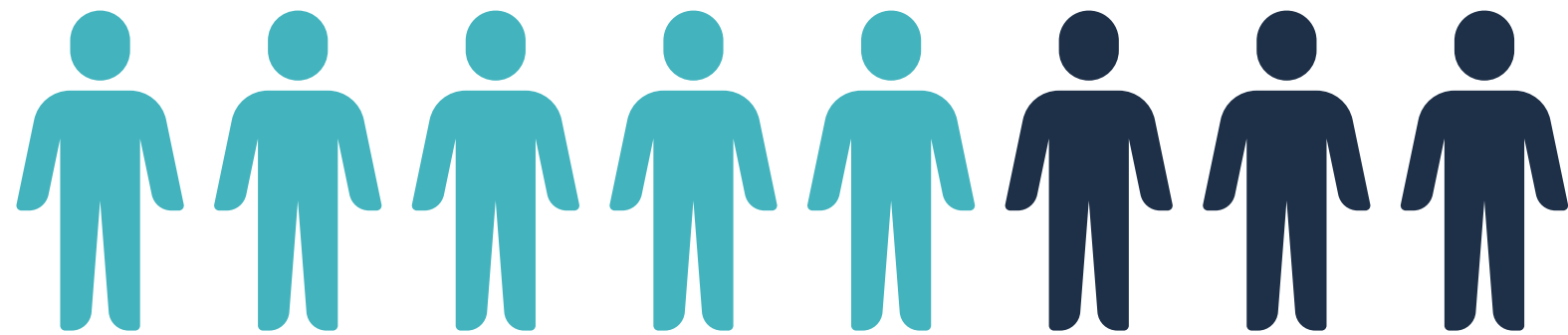



**KEY**


-  Non-DUI 3+ party
-  Non-DUI 2 party
-  Non-DUI 1 party
-  DUI 3+ party
-  DUI 2 party
-  DUI 1 party





Noticeable impact overall,  
 maximizing **safety**  
 &  
 minimizing harm.




- 

**California:**  
 Fatality rate decreased by 50-70%  
 injury rate by 20%  
 post-roundabouts
- 

**Central Valley:**  
 Fatality rate decreased by 100%  
 injury rate by 35% post-  
 roundabouts
- 

**Impaired Driving:**  
 A significant share of crashes involve  
 impairment; when excluded,  
 roundabouts demonstrate significantly  
 stronger safety performance.
- 

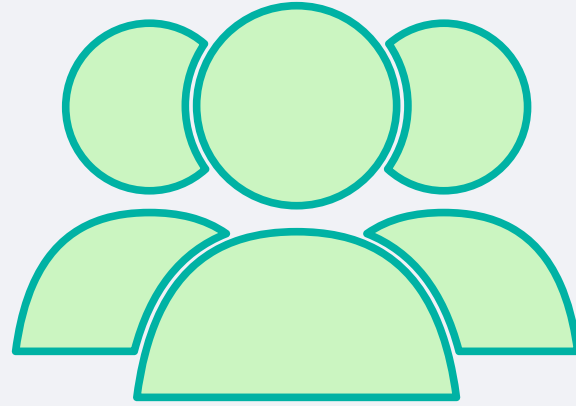
Overall, roundabouts improve road  
 safety, reducing severe crashes and  
 fatalities, and is a positive impact  
 on transportation safety

The background features a collection of digital devices including a laptop, a tablet, and a smartphone, all displaying a website creation interface. The interface includes the text "Create your own beautiful website" and "Just browse our 1000s of templates and choose one". There are also icons for "Start Now" and "Fully responsive and mobile optimized". The devices are arranged on a dark blue surface, with a small green plant in the bottom right corner and a white keyboard visible in the center.

# Objective 2: Public Sentiment Surveys

# 2 Survey Types

4. PUBLIC SENTIMENT



## PUBLIC SECTOR

Online  
Qualtrics

Evaluate public sentiment on traffic flow, safety, design preferences, efficiency, satisfaction, & improvement areas



## BUSINESS SECTOR

In-Person  
Qualtrics

Gather feedback from nearby business owners on the roundabout's impact before and after construction.

The image features a blue-tinted background showing the silhouettes of several business professionals in a modern office setting. They are standing near large windows, some in conversation. The text 'Section 1: Public Survey' is overlaid in a large, white, sans-serif font, centered horizontally and partially overlapping the silhouettes. The text is split into two lines: 'Section 1:' on the top line and 'Public Survey' on the bottom line.

# Section 1: Public Survey

# Public Sample Design Framing

**INTRODUCTION**

**KNOWLEDGE OF RULES**

**SCREENING QUESTIONS**

**SAFETY PERCEPTION**

**NEGATIVE & POSITIVE INFORMATION**

**OPINIONS & PREFERENCES**

**FAMILIARITY**

**DEMOGRPAHIC QUESTIONS**

Evaluate public sentiment:

- Traffic flow
- Efficiency
- Design
- Safety
- Satisfaction
- Improvements



**TO VIEW SURVEY  
SCAN ME**

\*Distributed by Qualtrics

# Public Sample Design Framing

4. PUBLIC SENTIMENT



## Locations

Central Valley	200
SF	100
LA	100
Coast	50
All the rest	50

Total Sample: 500



## Gender

Male	200
Female	200
Other/prefer not to answer	100



## Age

18-30	163
30-50	163
Above 55	164



## Education

High school or below	163
Associate college degree	163
BS and higher	164



## Income

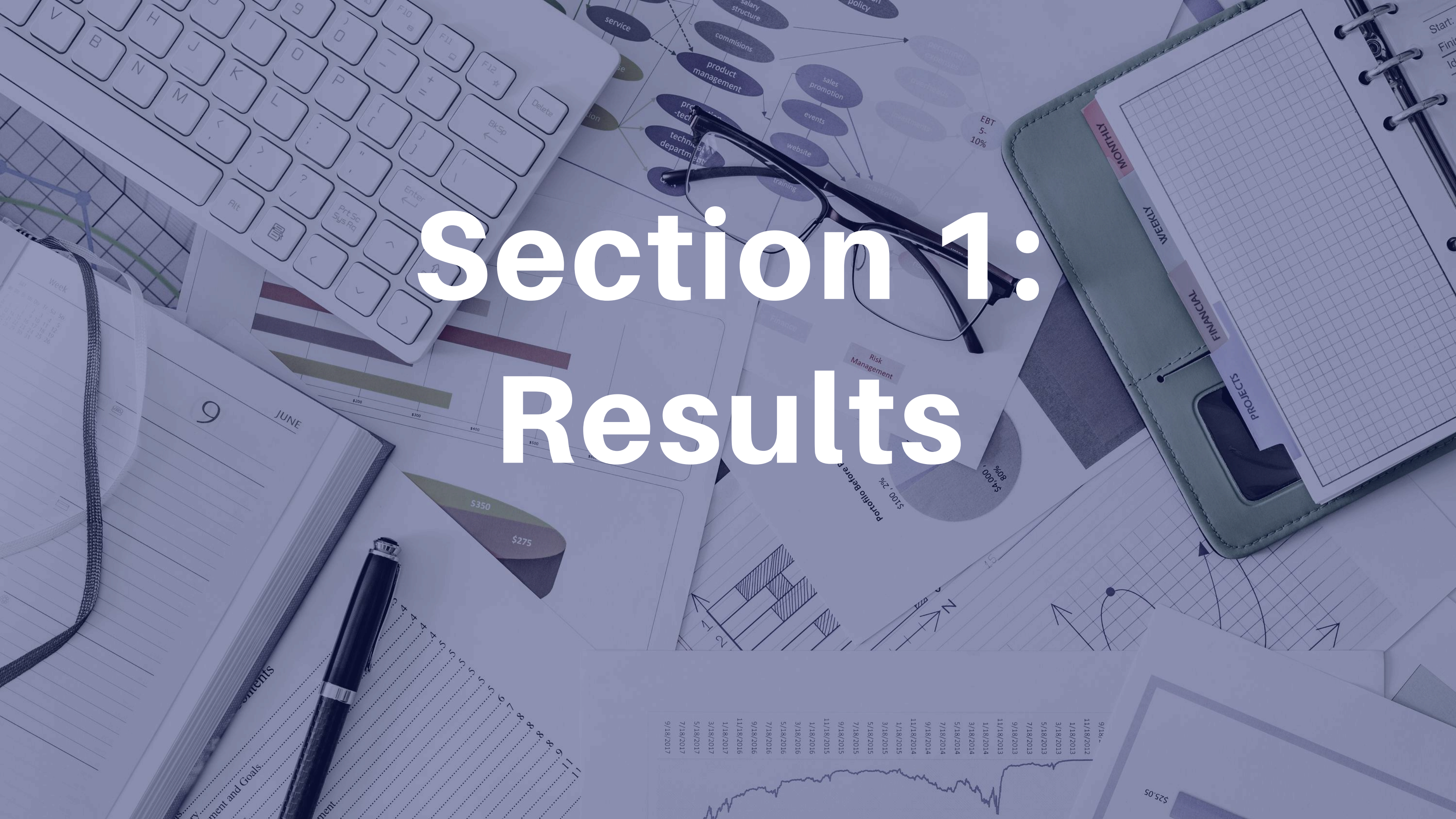
Income Less than 50K	163
50 K to 100 K	163
Above 100 K	164



## Modes

Pedestrian Cyclists	150
Motorist	350

# Section 1: Results



# Public Survey Sections

1

**Use & Awareness**

5

**Involvement & Support**

2

**Knowledge of Roundabouts**

6

**Recommended Improvements**

3

**Comfort Level & Main Concerns**

7

**Conclusion**

4

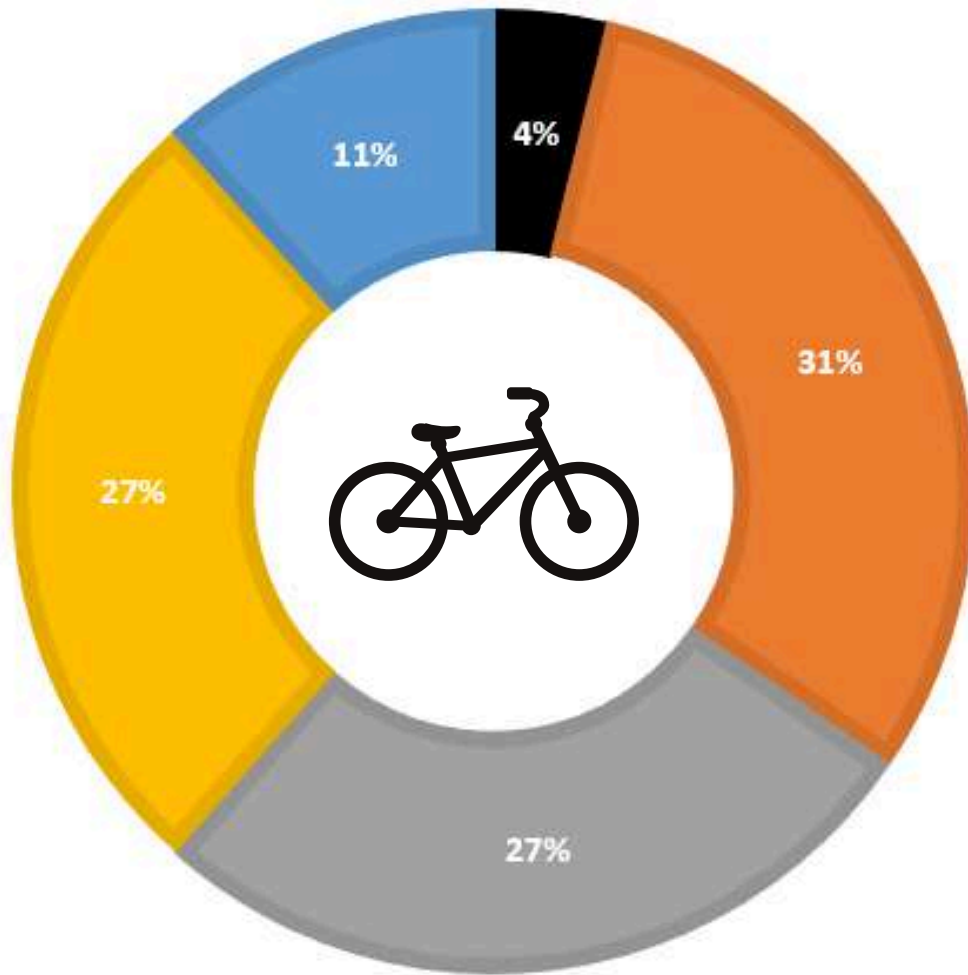
**Design Preference**



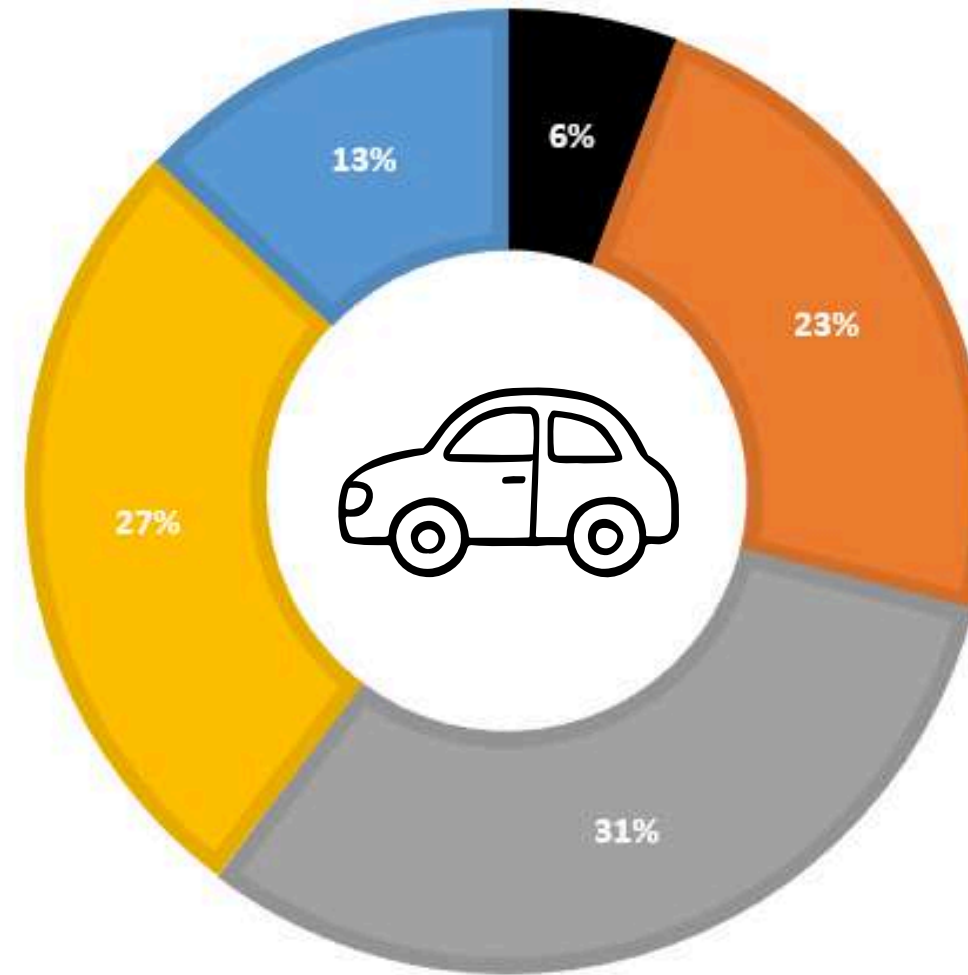
# Use and Awareness

# Roundabouts Frequency of Use

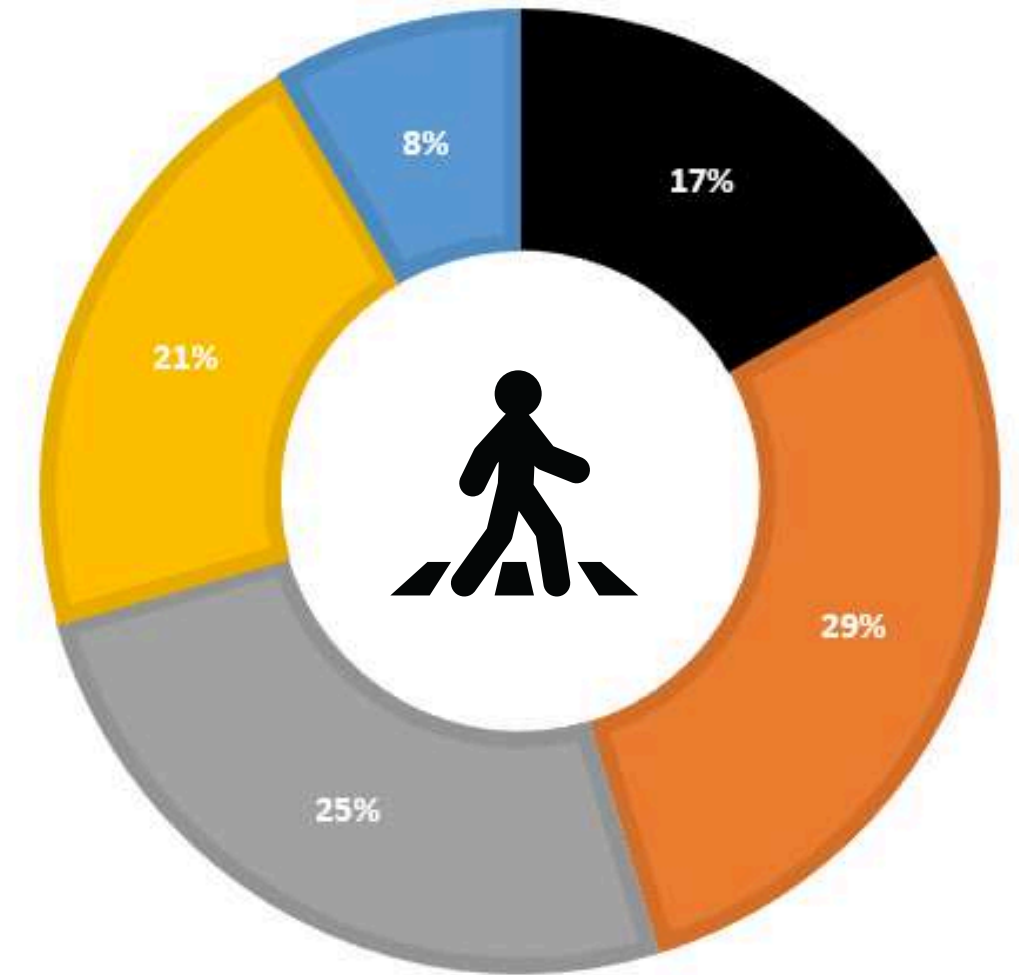
Never used a roundabout
  Rarely, once a year
  Sometimes, once a month
  Frequently, once a week
  At least once a day



65% use roundabouts at least once a month  
38% use roundabouts at least once a week



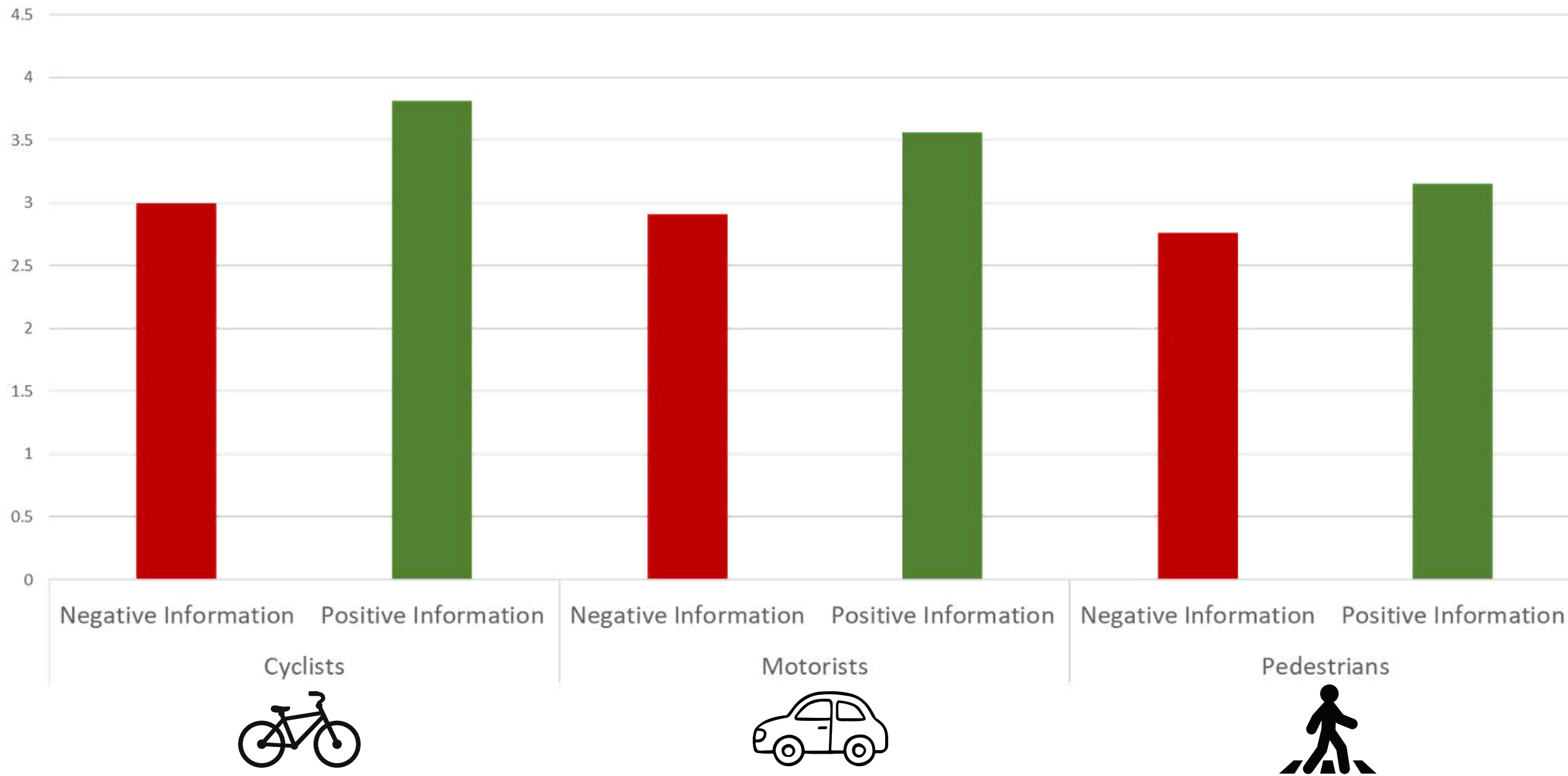
71% use roundabouts at least once a month  
40% use roundabouts at least once a week



54% use roundabouts at least once a month  
29% use roundabouts at least once a week

4. PUBLIC SENTIMENT

### Negative vs. Positive Information



- **Positive** > **negative** sentiment
- Scores below midpoint, means low awareness
- Opportunity for improved messaging



# Knowledge of Roundabouts

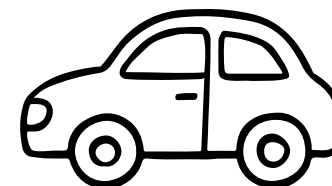
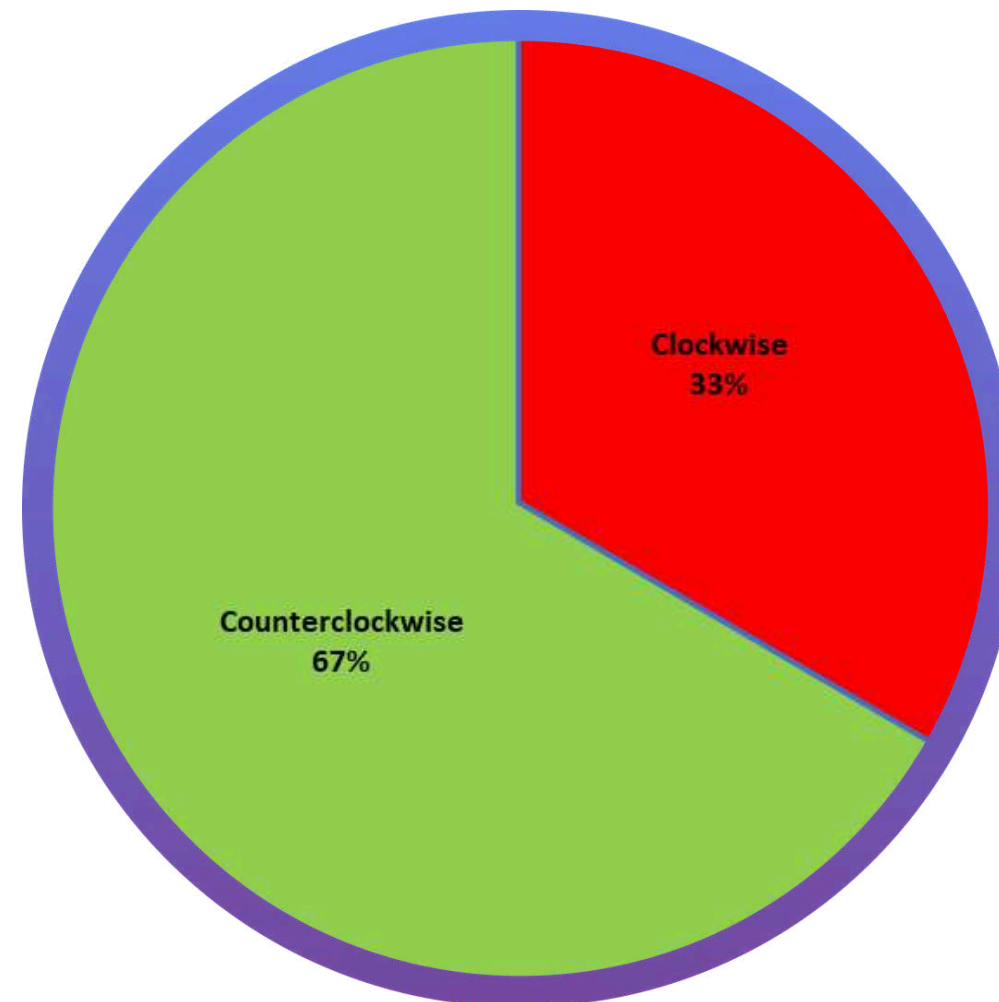
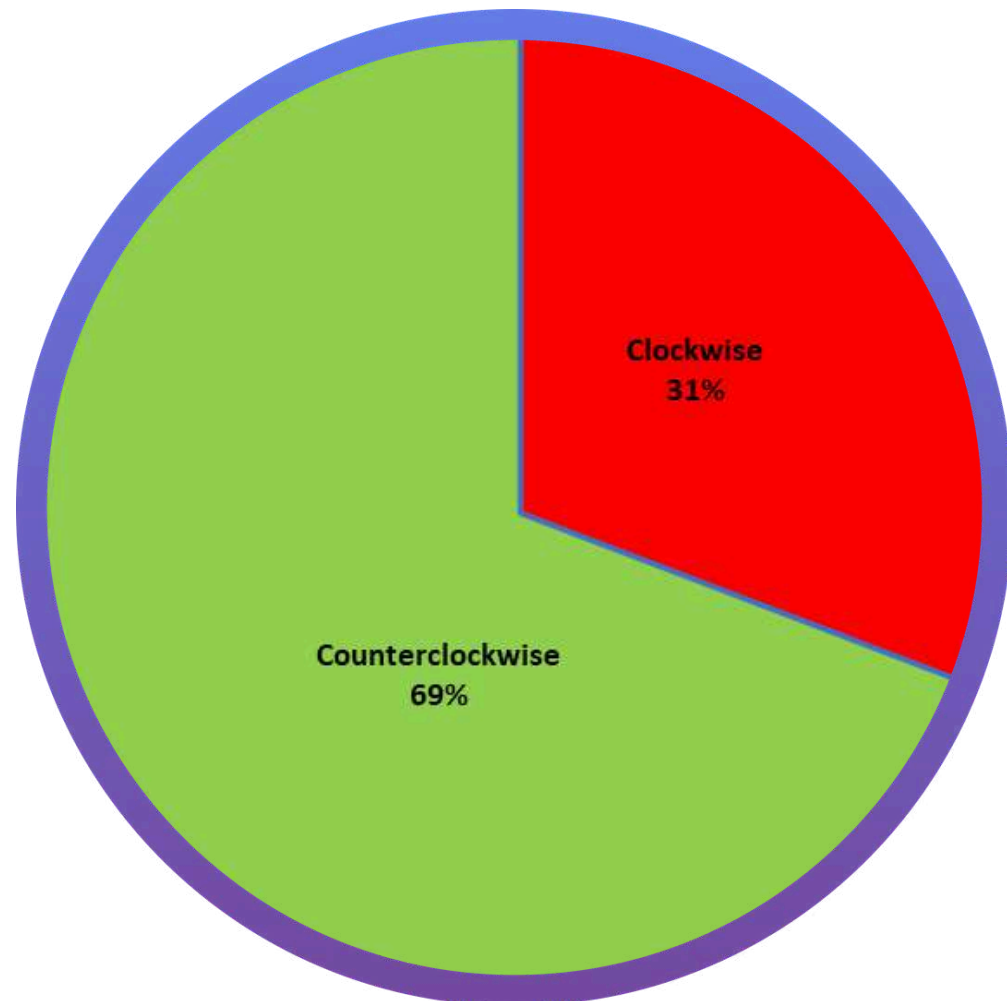
### Perceived Level of Knowledge of the Rules using Roundabouts



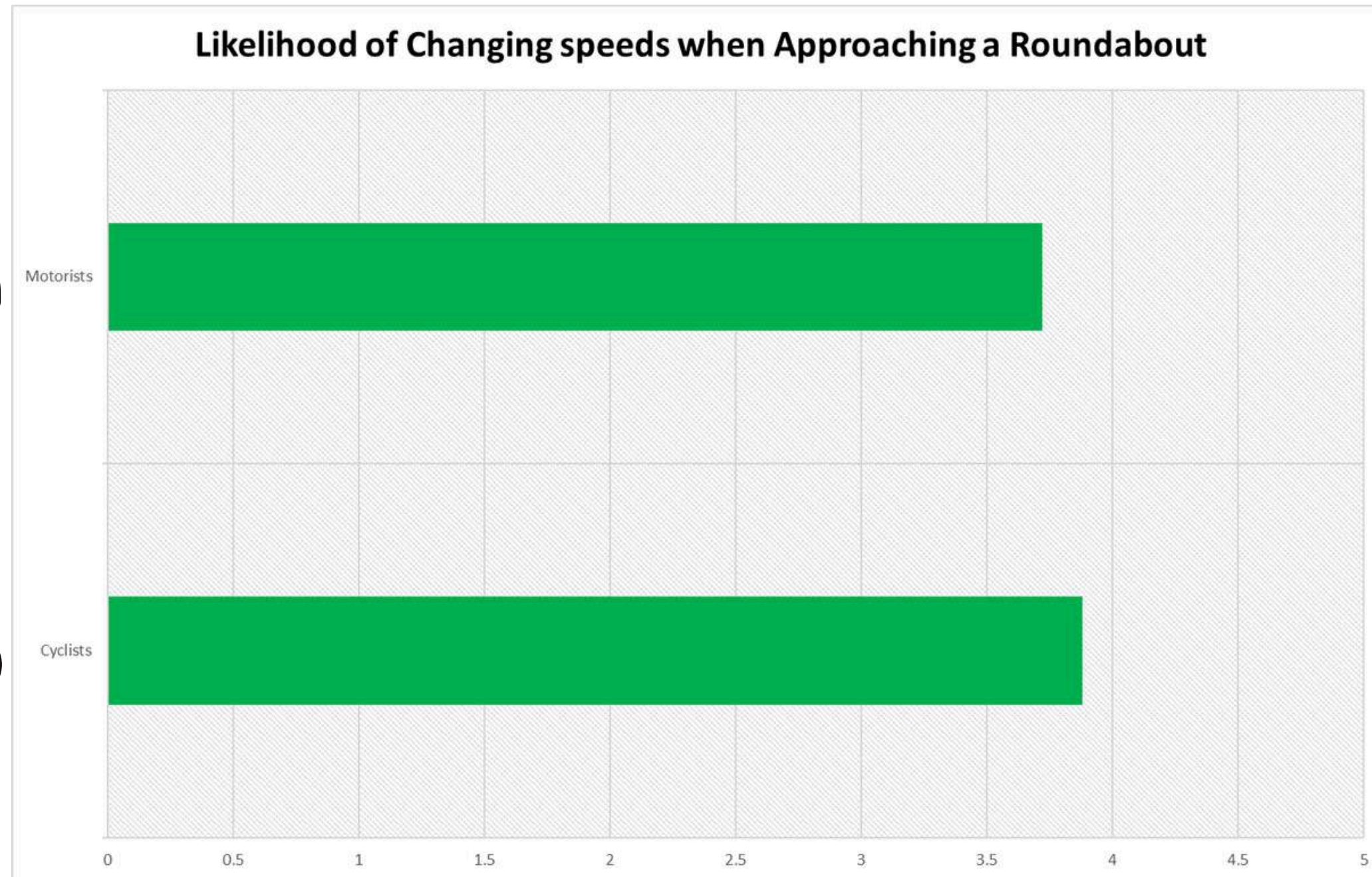
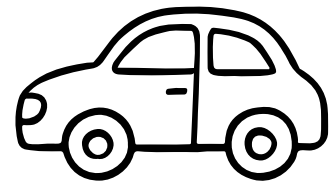
- All scores are above the midpoint (3 on a 1-5 scale)
- Respondents rate their knowledge of roundabout rules as moderate to high
- Green bar is strongest self-reported knowledge among groups

# Roundabouts Travel Direction

4. PUBLIC SENTIMENT

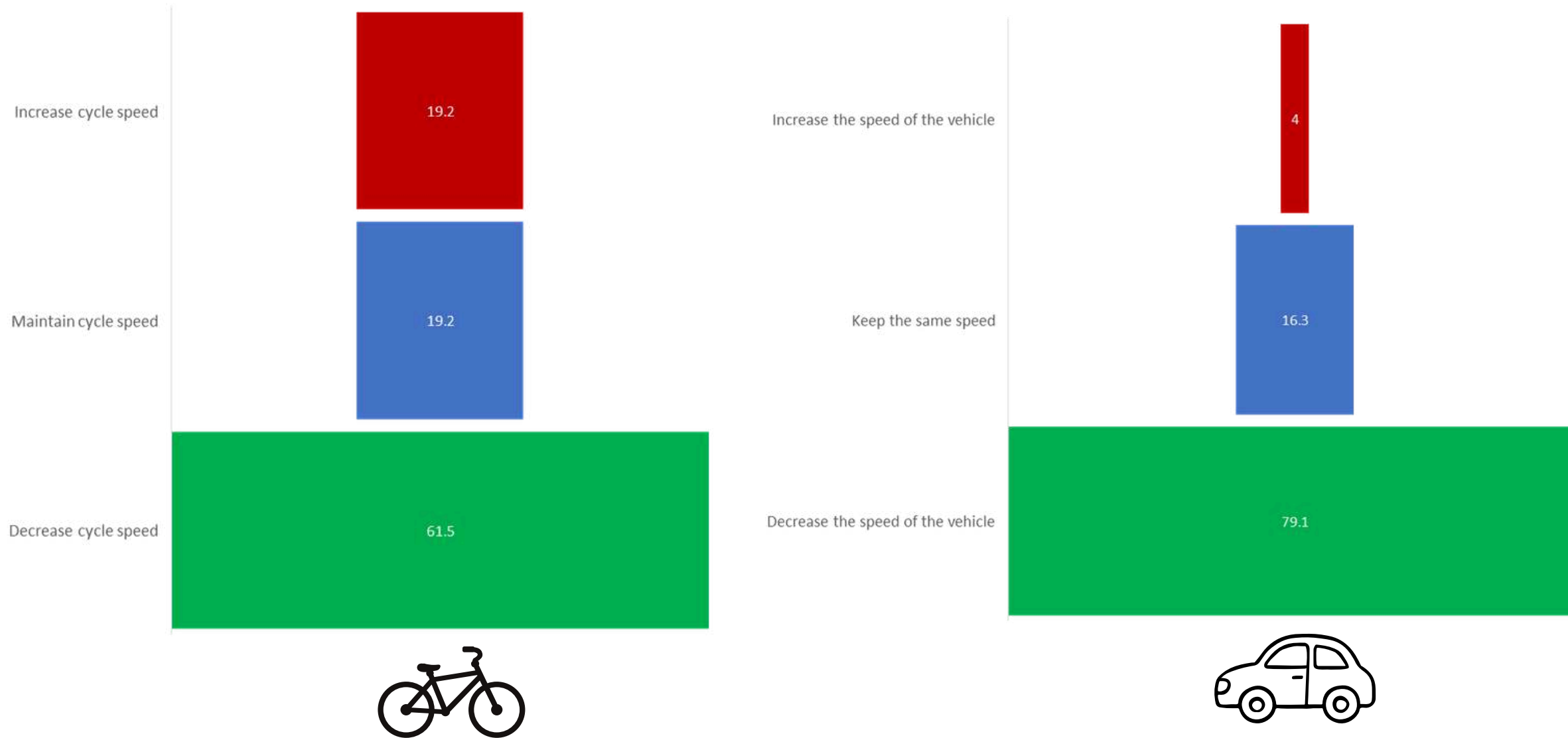


- $\frac{2}{3}$  of Users **understand** Roundabout Travel Direction
- Still major room to reduce **confusion** for portion of users



- All scores are above the midpoint (3 on a 1-5 scale)
- **Green bar** is significantly higher than the midpoint of the scale
- Shows understanding of approach of roundabouts

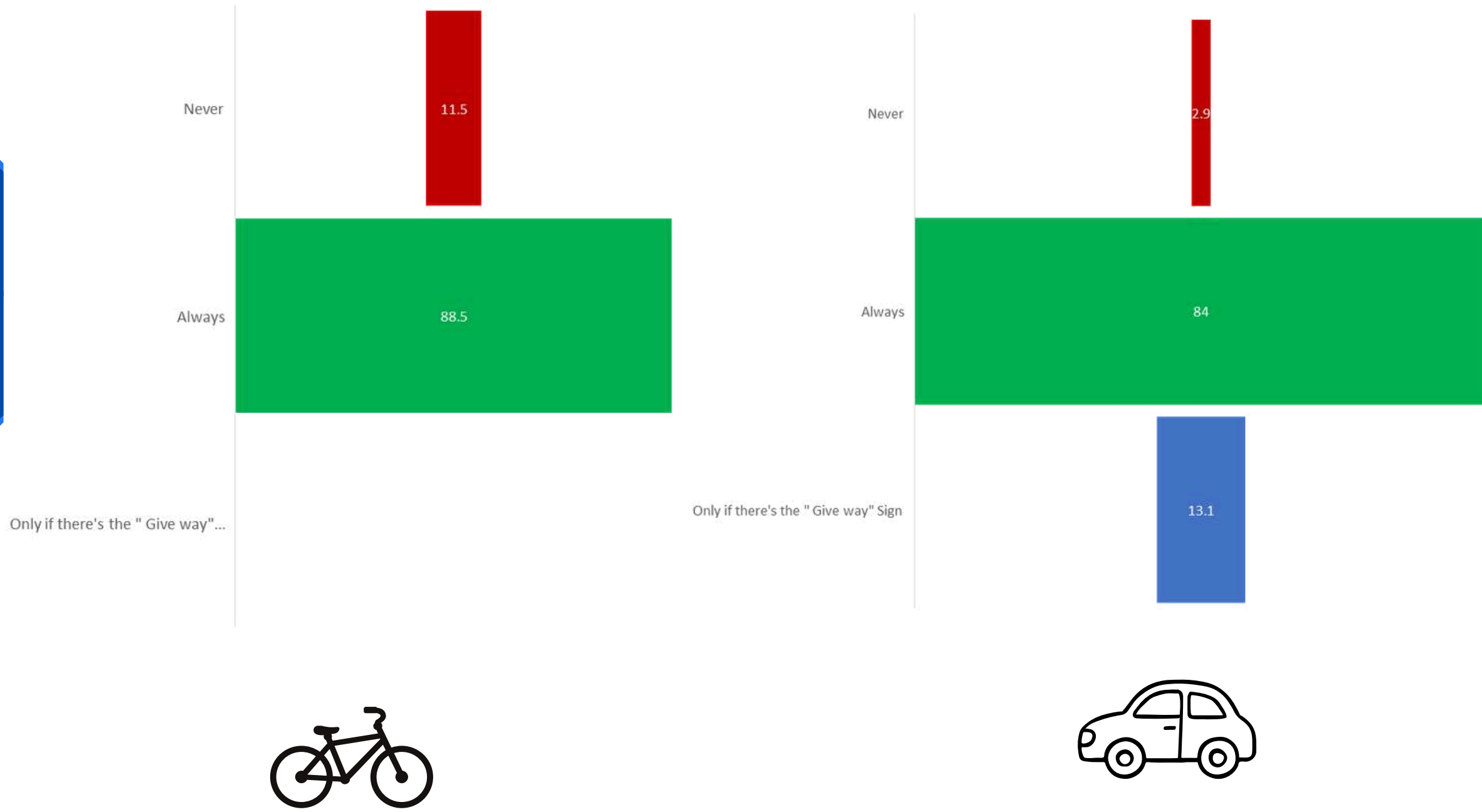
4. PUBLIC SENTIMENT



- Majority of users decrease speed when entering a roundabout
- Cyclists are significantly more likely to increase or maintain speed compared to drivers

# Giving Priority to Vehicles Inside

4. PUBLIC SENTIMENT

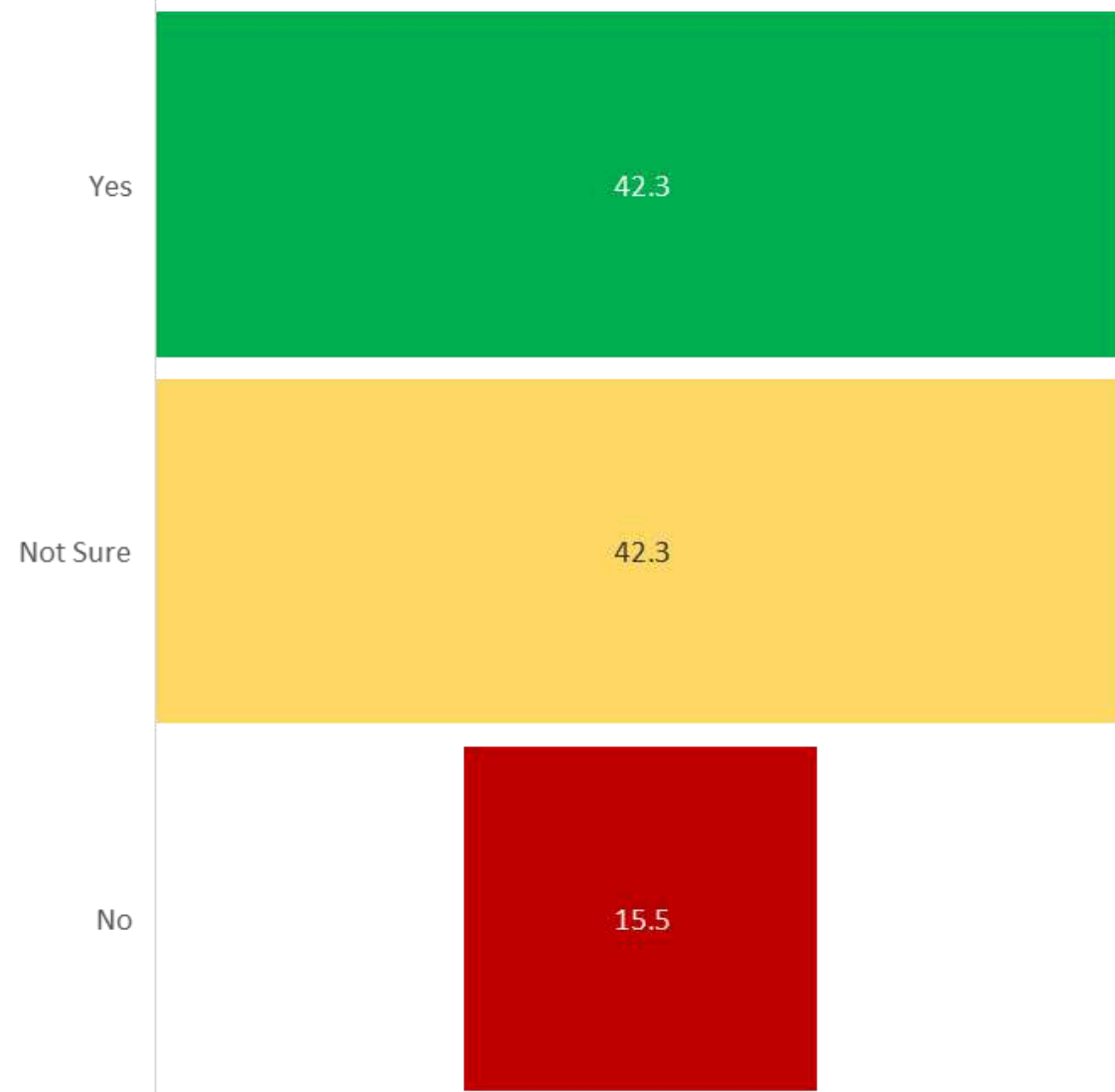


- Majority of users yield to vehicles inside the roundabout
- Opportunity for educating on usage of roundabout

# Pedestrians Knowledge

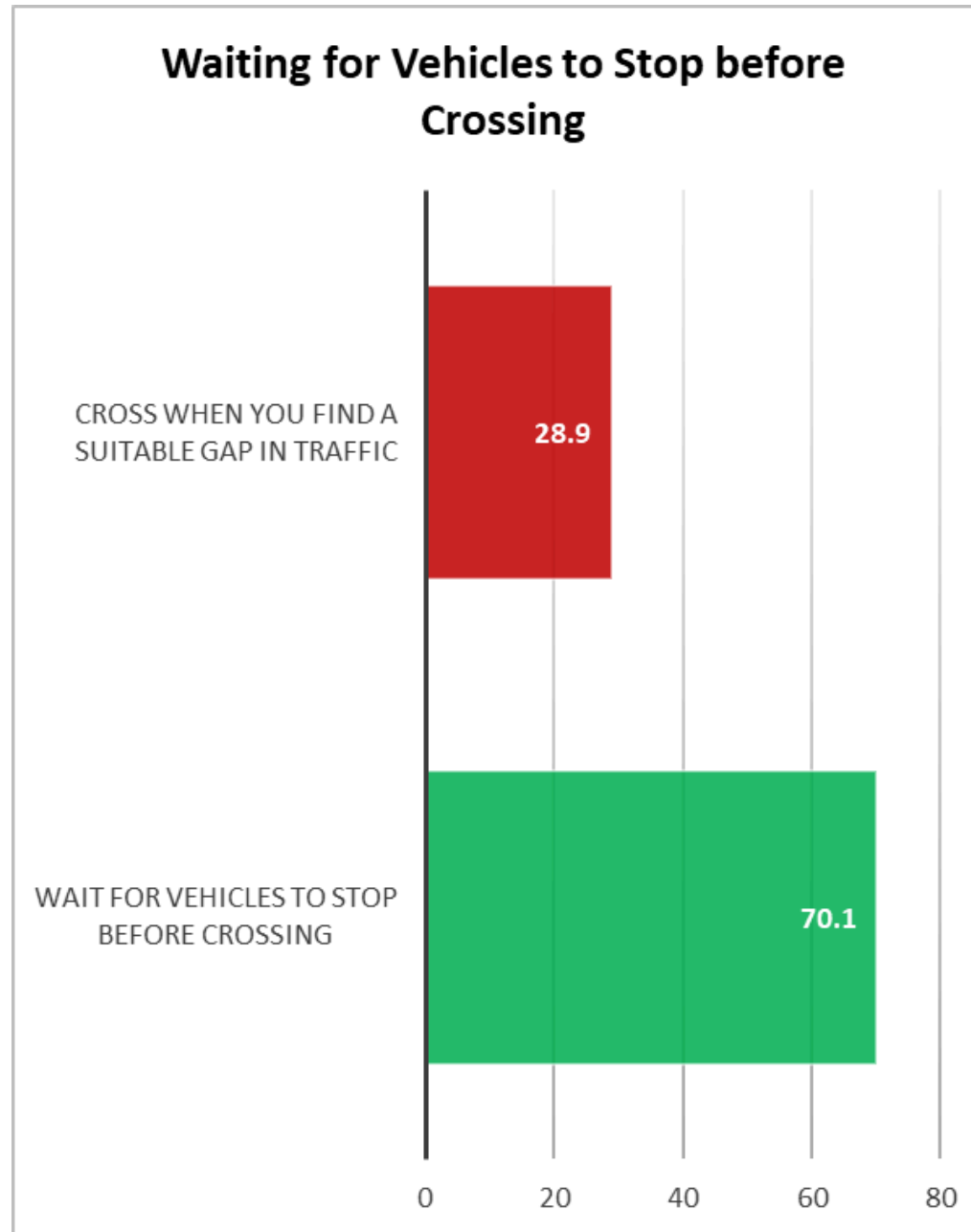
4. PUBLIC SENTIMENT

## Awareness of Designated Crosswalks Located at Roundabout



Only 42% are aware of designated crosswalks

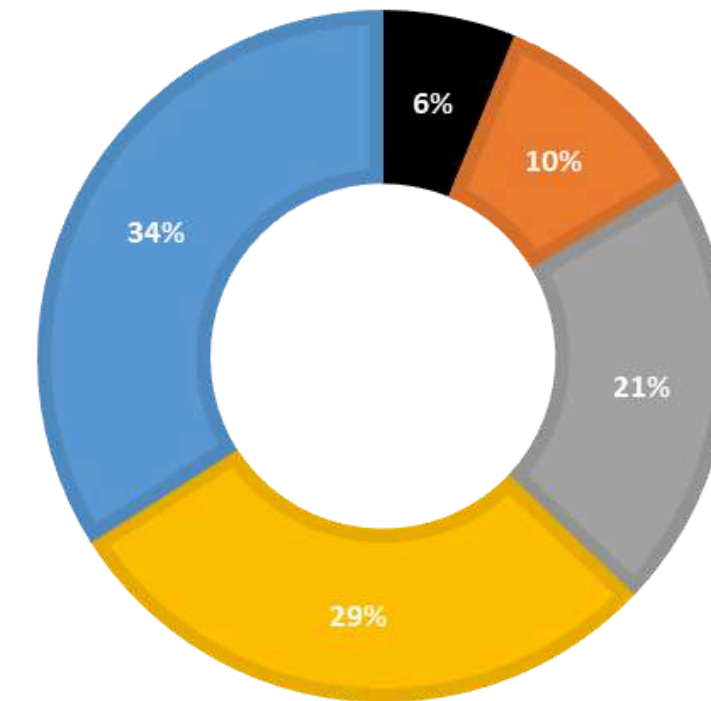
## Waiting for Vehicles to Stop before Crossing



30% cross when finding a gap

## LIKELIHOOD TO STOP AND WAIT FOR VEHICLES BEFORE CROSSING A ROUNDABOUT

- Extremely unlikely
- Somewhat unlikely
- Neither likely nor unlikely
- Somewhat likely
- Extremely likely



63% are likely Stop and Wait for Vehicles

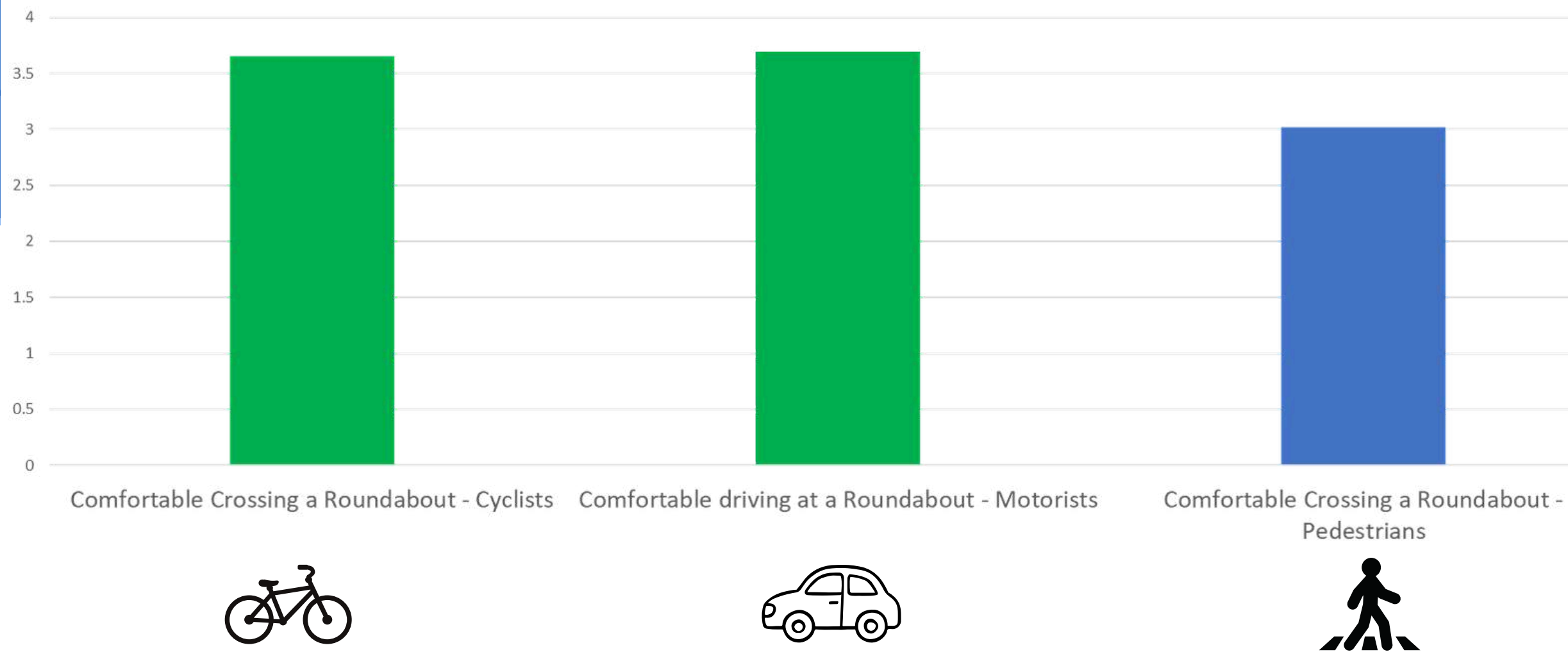




# Comfort Level & Main Concerns



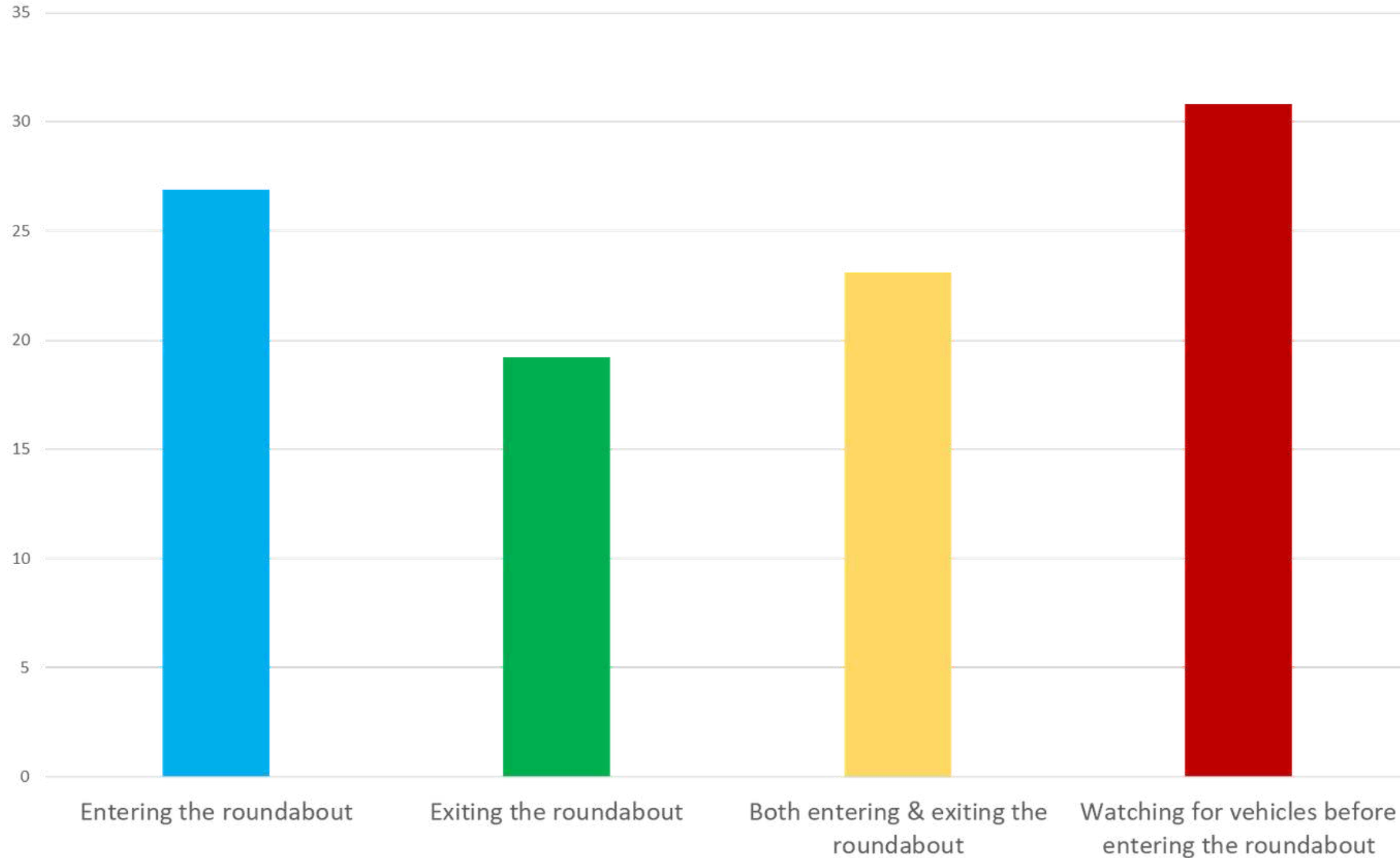
### Comfort Level Crossing or Driving at a Roundabout



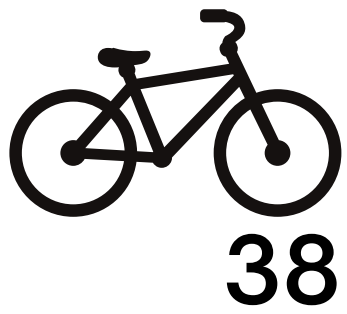
- All scores are above the midpoint (3 on a 1-5 scale)
- **Green bar** is significantly higher than midpoint.
- Pedestrians are the least comfortable when crossing

# Discomfort

### Cyclists' Most Discomfort while Crossing a Roundabout



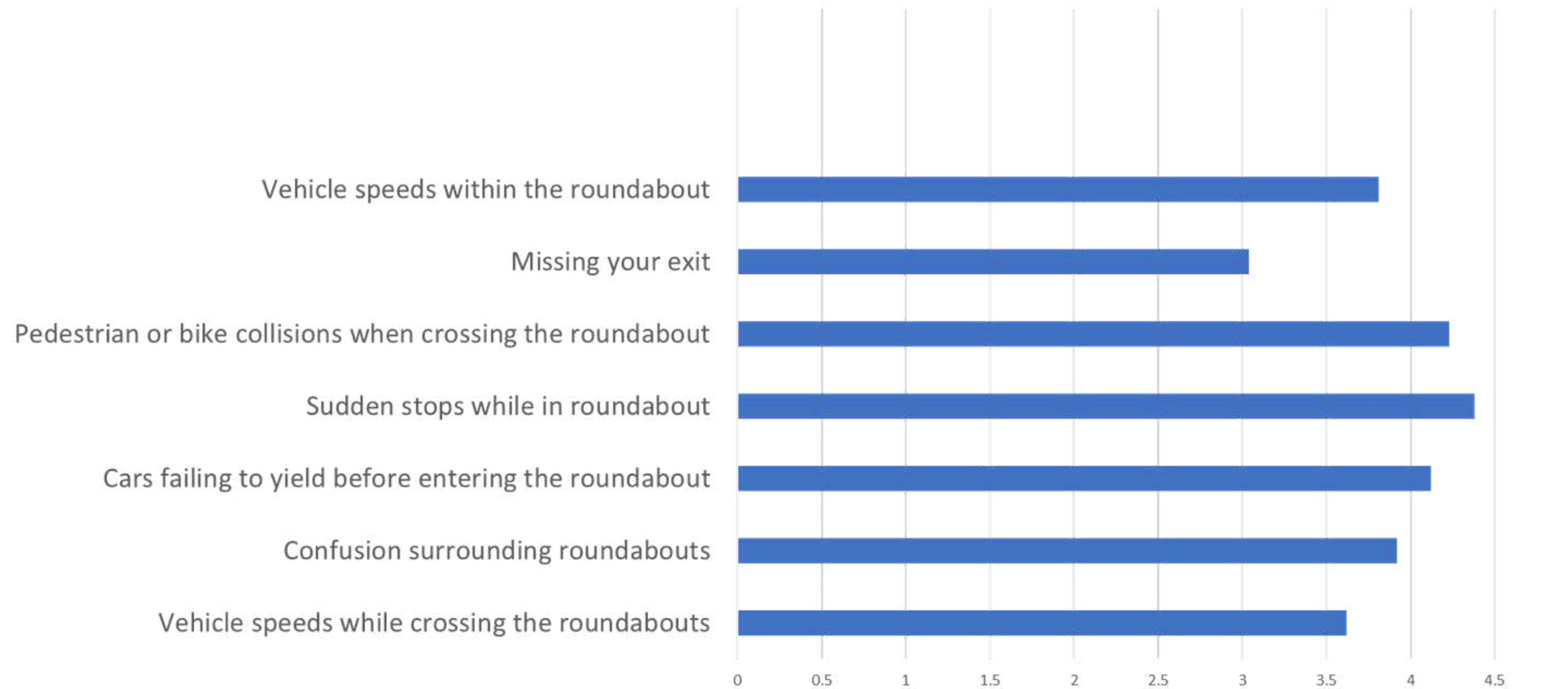
- Cyclist discomfort is mainly caused by interactions with other users
- Entering the roundabout is the moment where cyclists feel the most discomfort



4. PUBLIC SENTIMENT

# General Concerns

Cyclists' General Concerns regarding Roundabouts

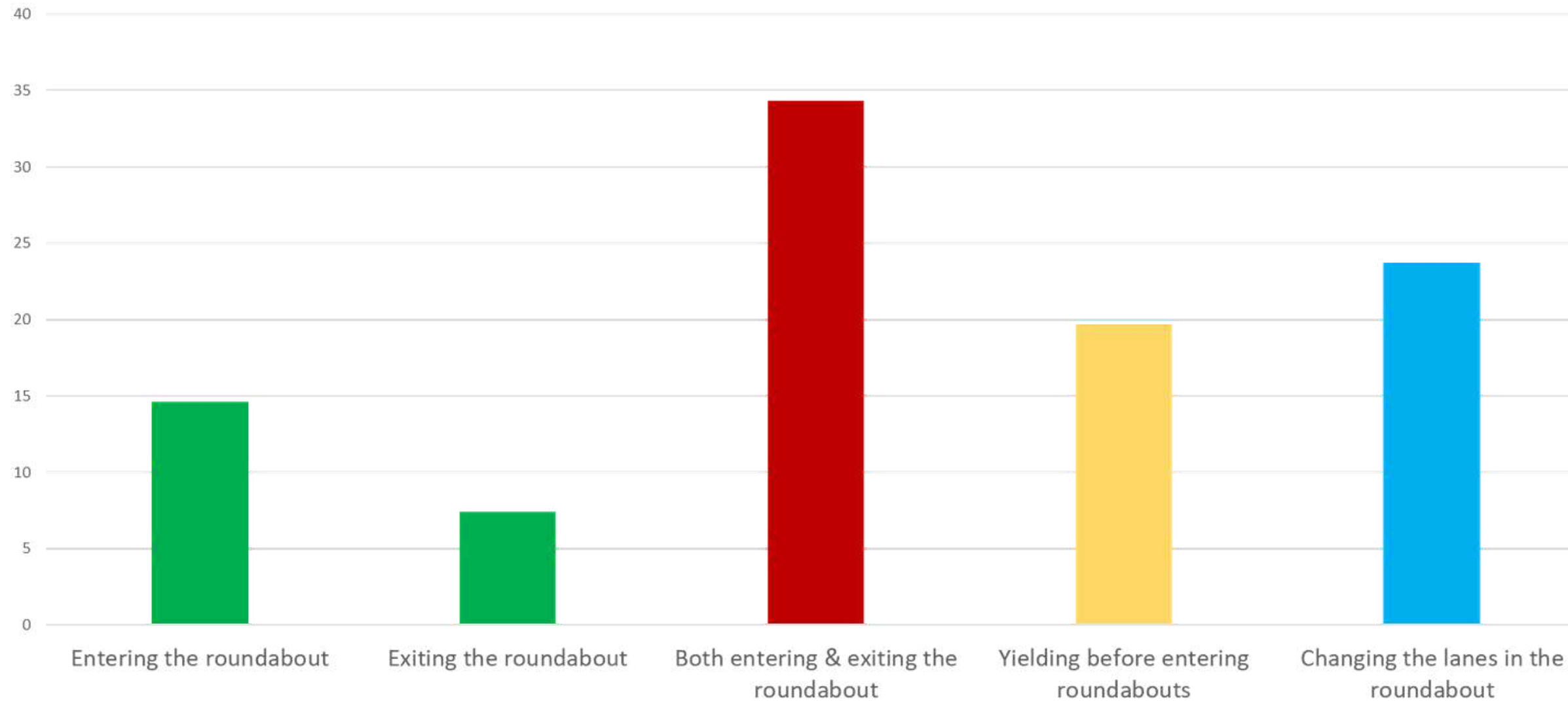


- No Significance from the midpoint of the scale.
- Sudden stops are the top concern
- Drivers failing to yield is the second concern
- Confusion on how to use roundabouts is the third concern



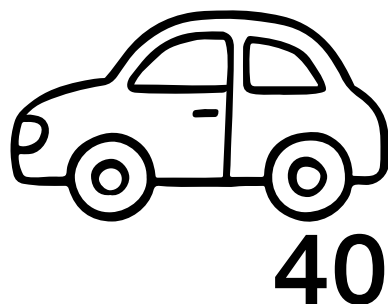
# Discomfort

### Motorists' Most Discomfort while Driving at a Roundabout



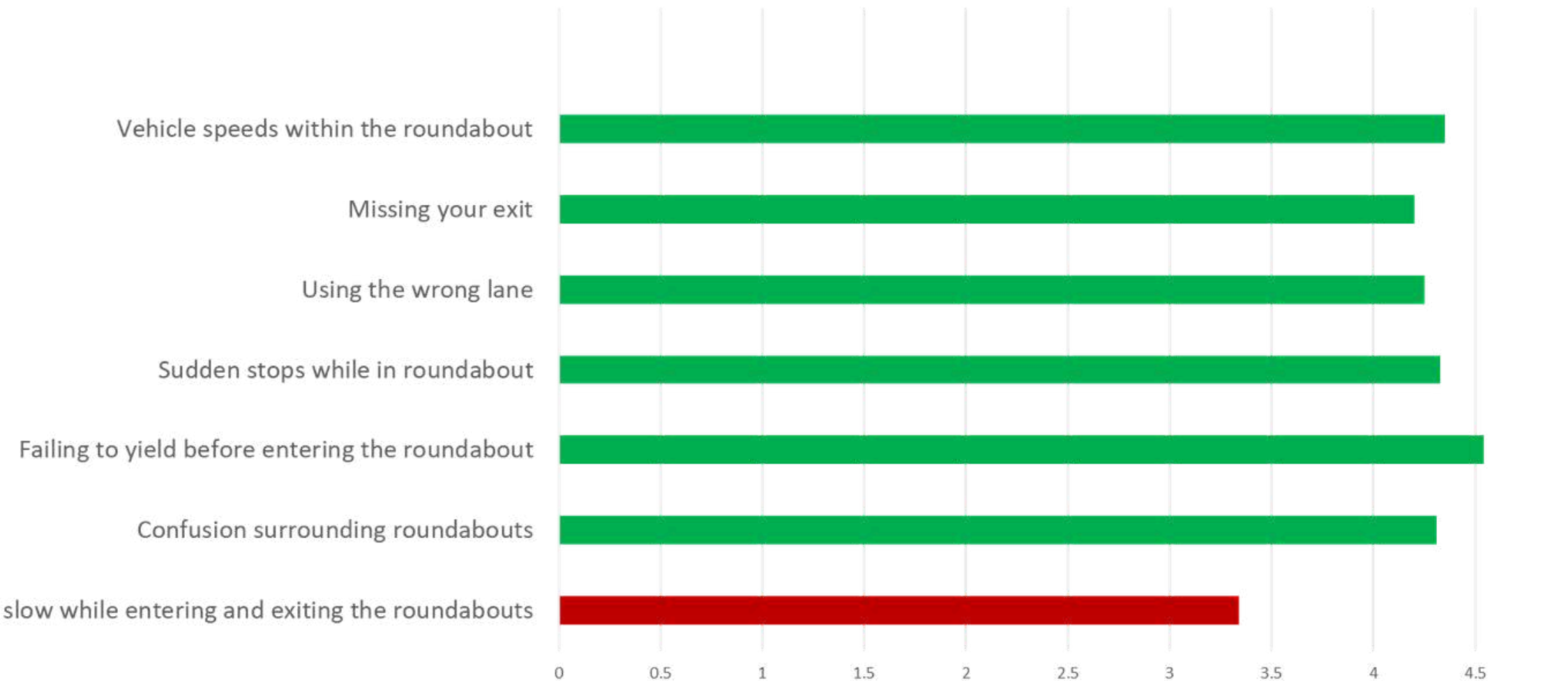
- Greatest discomfort occurs both entering and exiting
- Lane changes inside the roundabout is also a major concern

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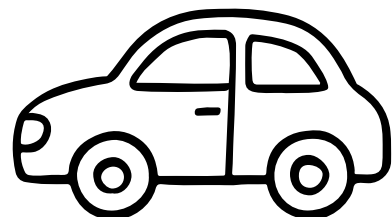
# General Concerns

### Motorists' General Concerns regarding Roundabouts



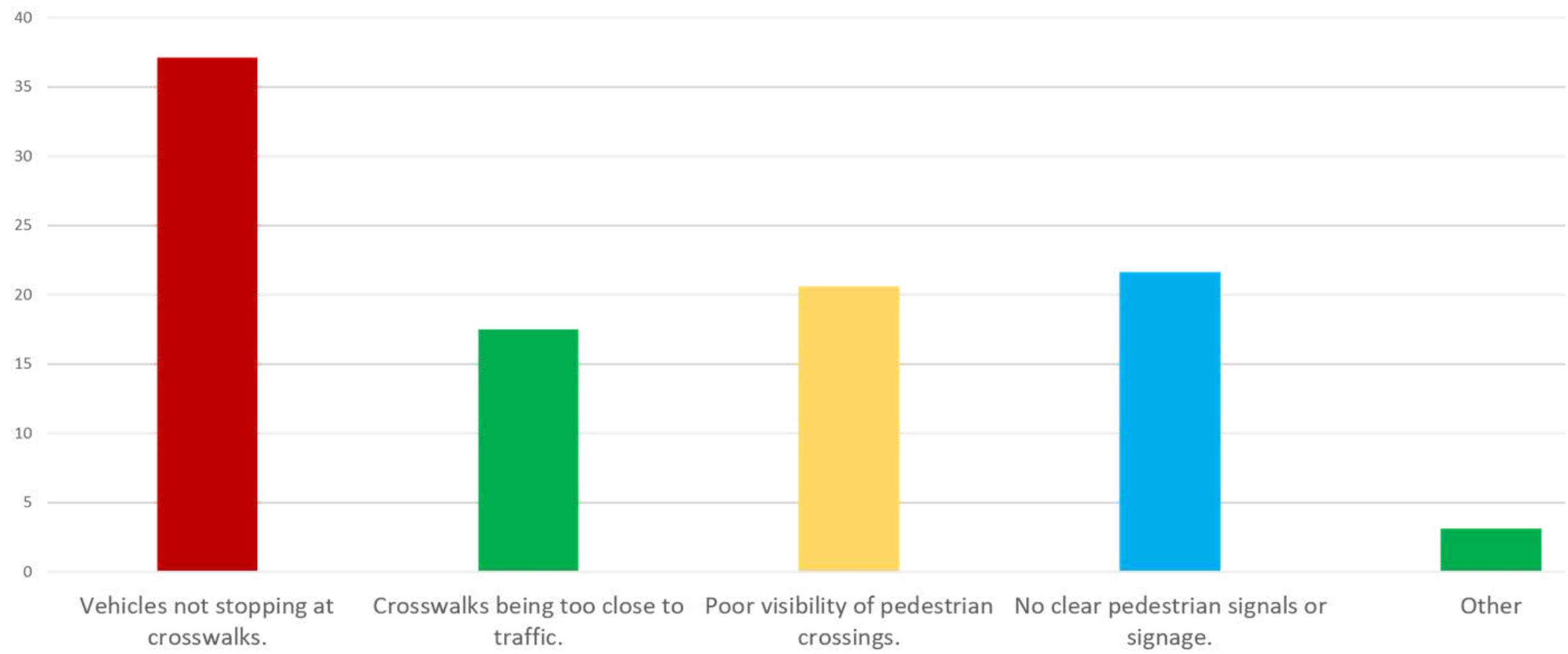
- **Green bar** is significantly higher than midpoint.
- **Speed Limit** is significantly lower

4. PUBLIC SENTIMENT



# Discomfort

### Pedestrians' Most Discomfort while Crossing a Roundabout



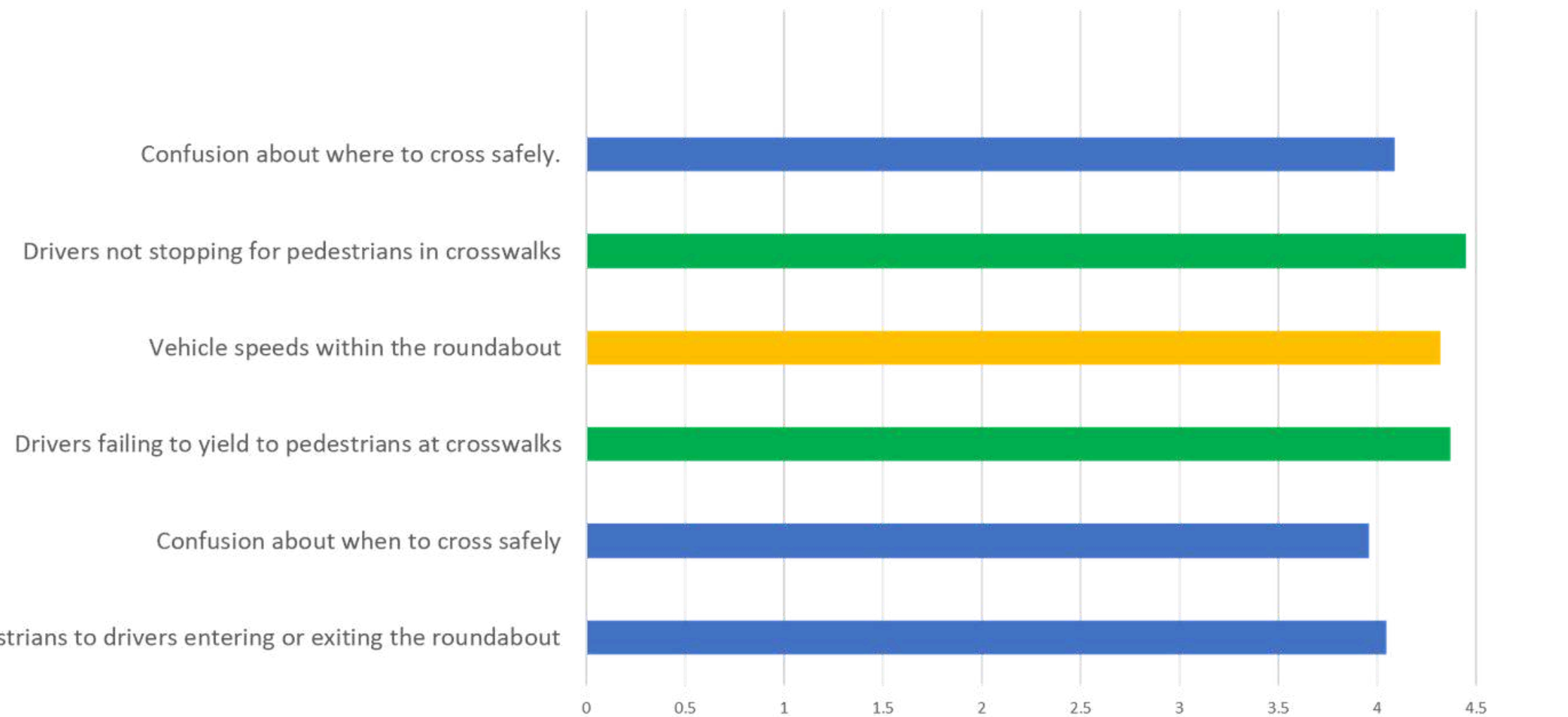
- Pedestrians main discomfort are from Vehicles not yielding

4. PUBLIC SENTIMENT



# General Concerns

### Pedestrians' General Concerns regarding Roundabouts



- **Green bar** is significantly higher than midpoint.
- Pedestrians concern stem from vehicles not yielding
- **Yellow bar** is marginally significantly than midpoint.
- Concern about Users Speeds

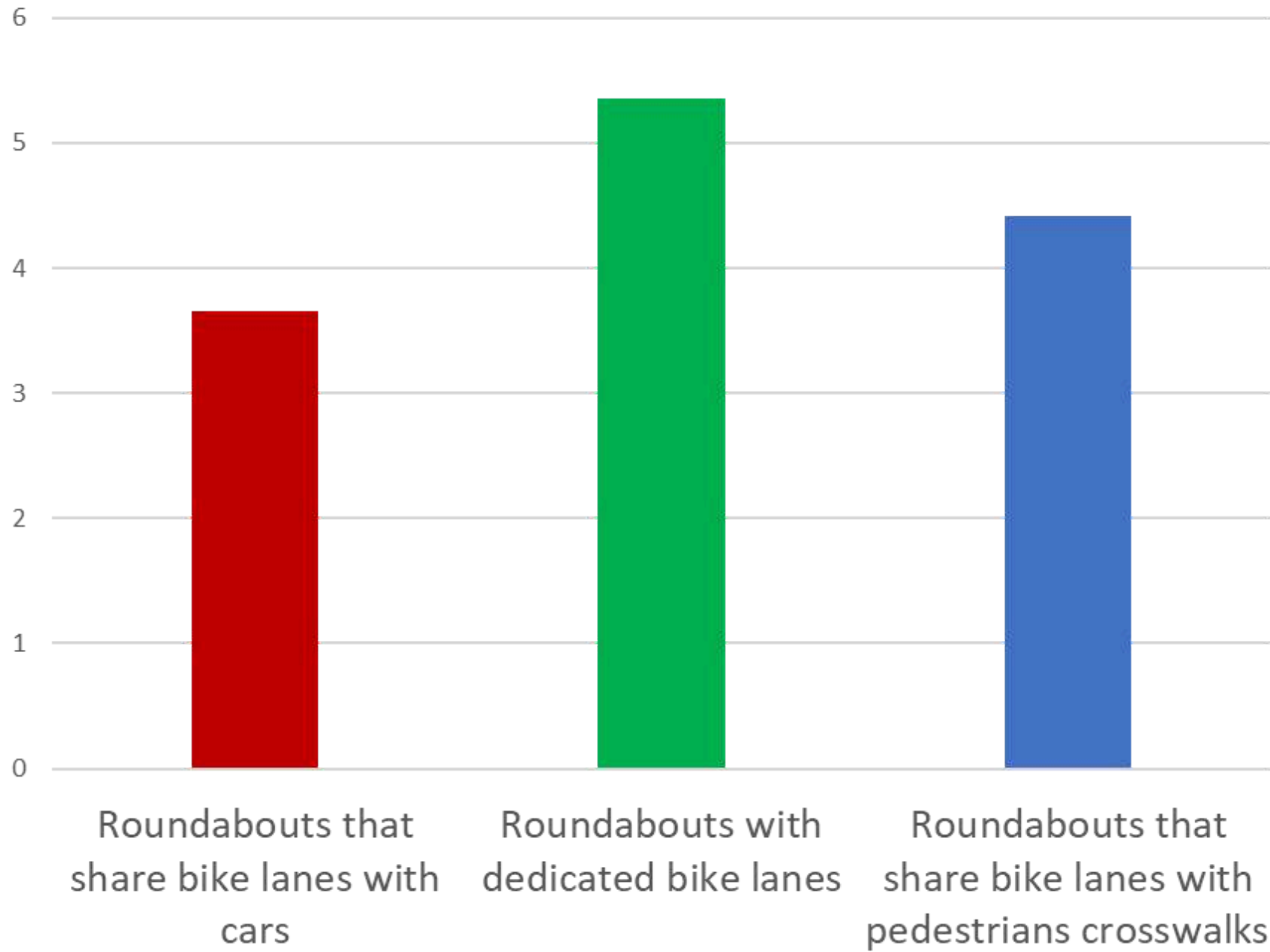
4. PUBLIC SENTIMENT



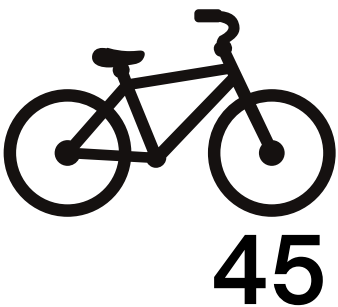
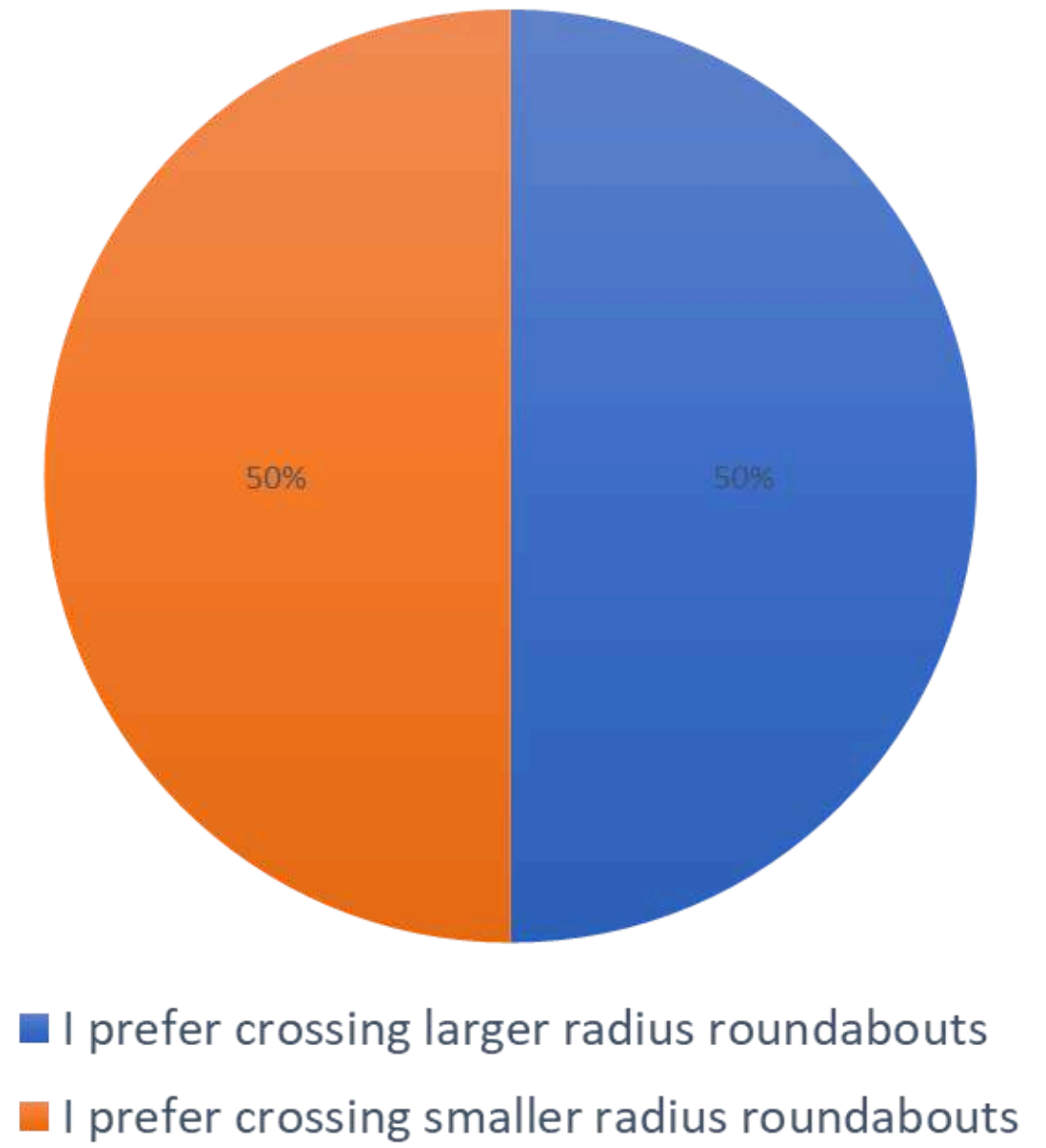


# Design Preferences

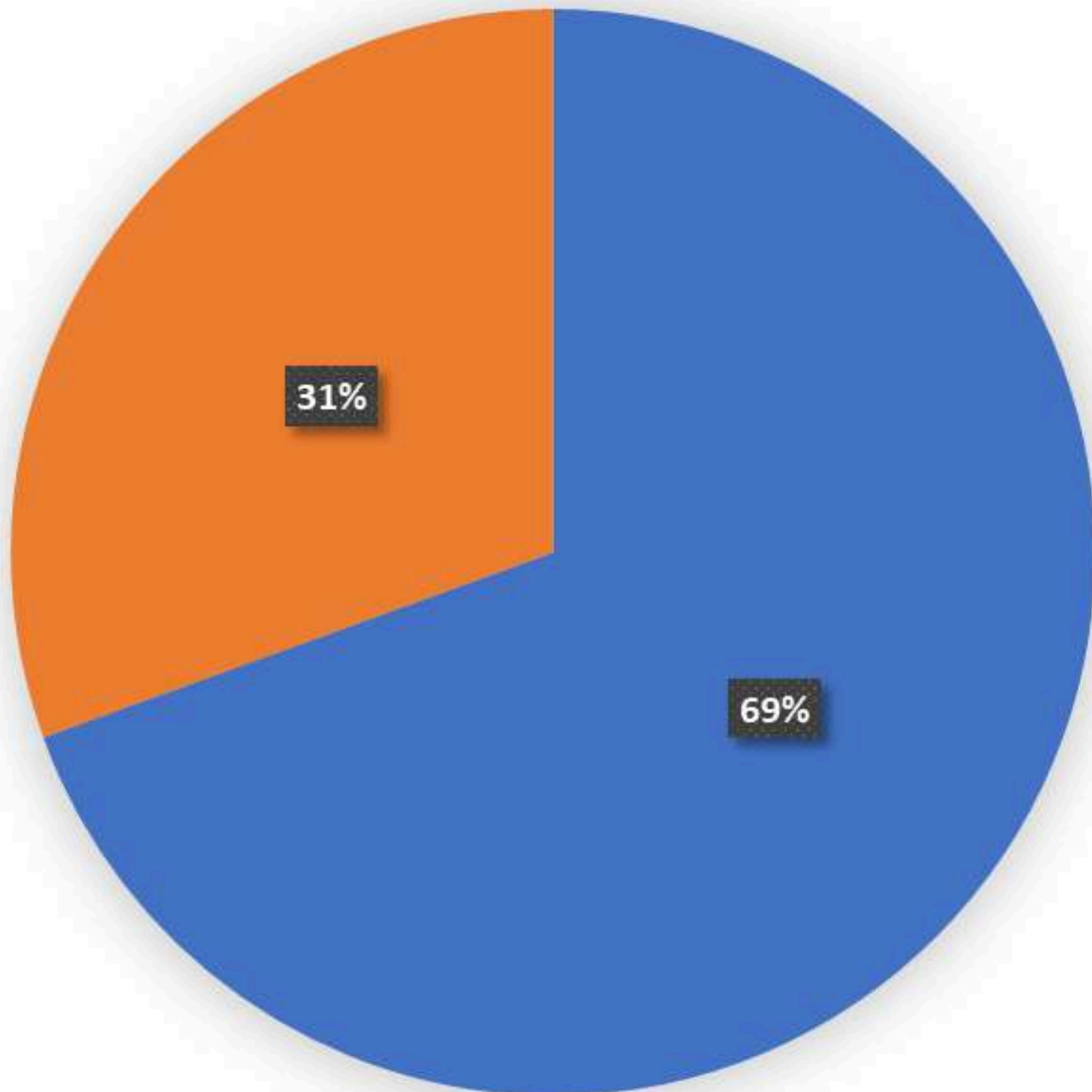
### Lane Design Preference for Cyclists



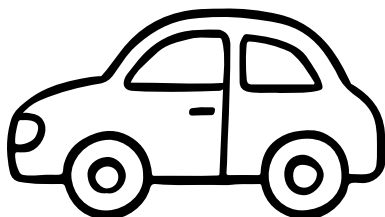
### Roundabouts Size Preference for Cyclists



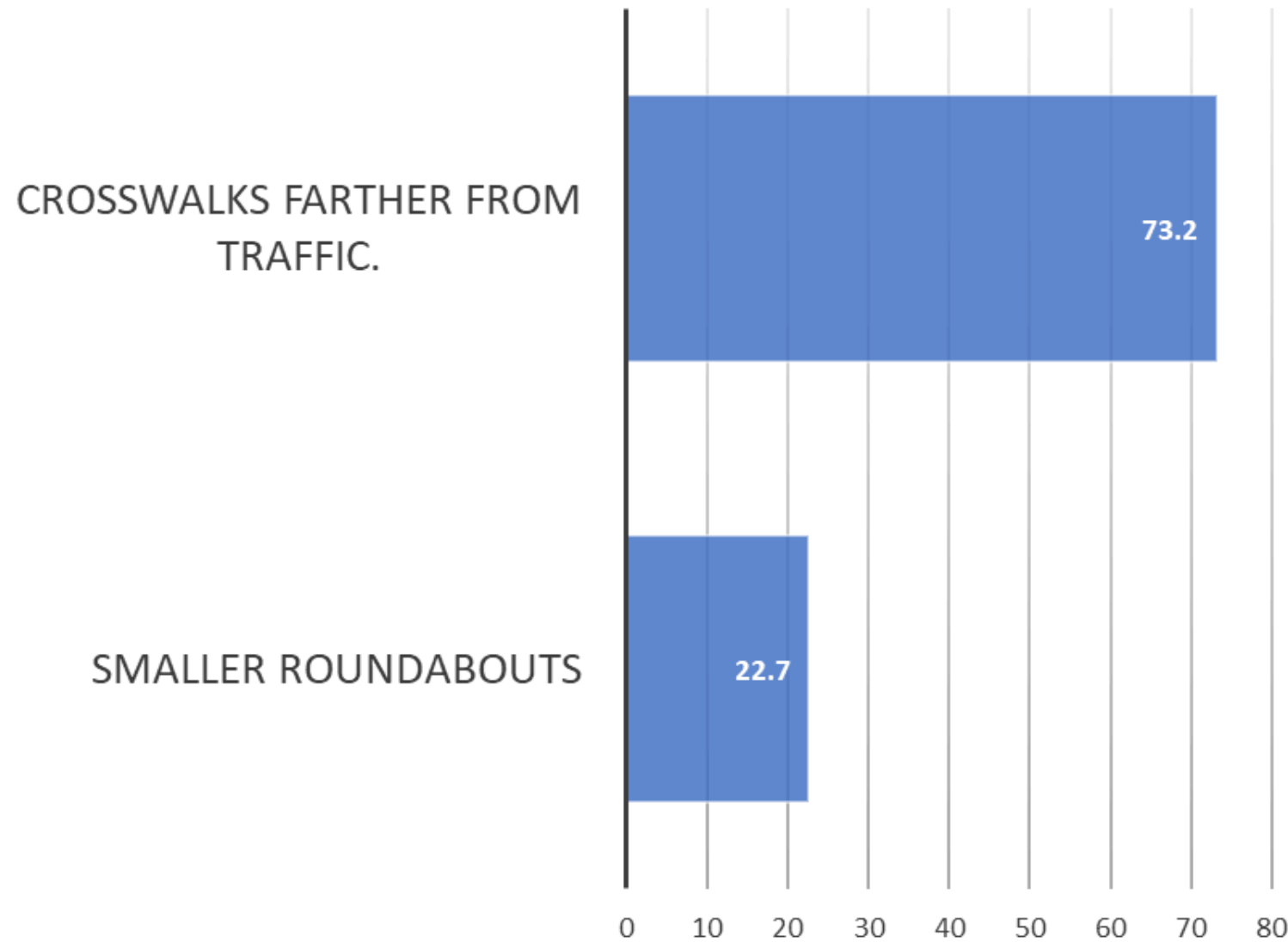
## Lane Design Preference for Motorists



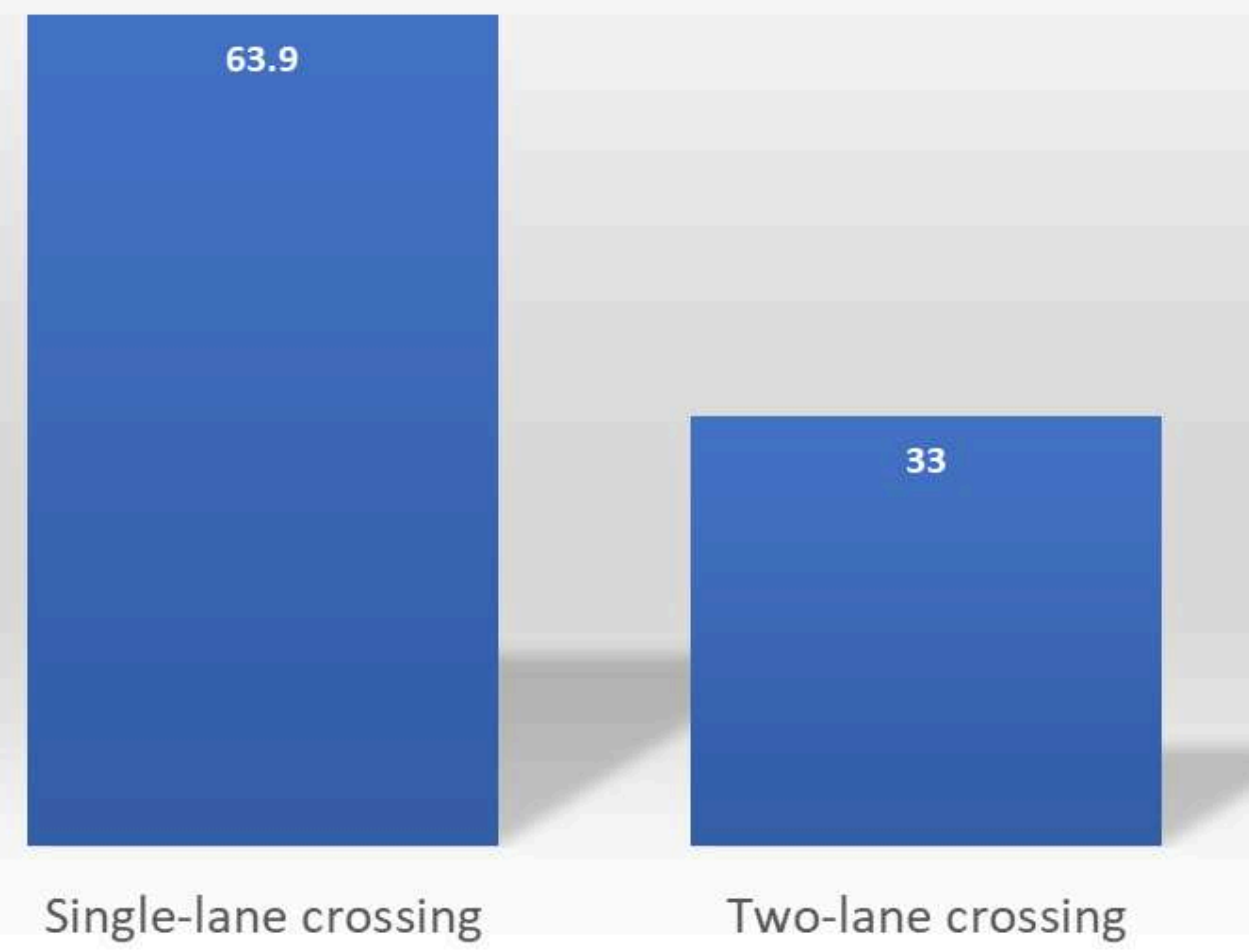
- I prefer single-lane roundabouts
- I prefer roundabouts with two through lanes



### Lane Design Preference for Pedestrians



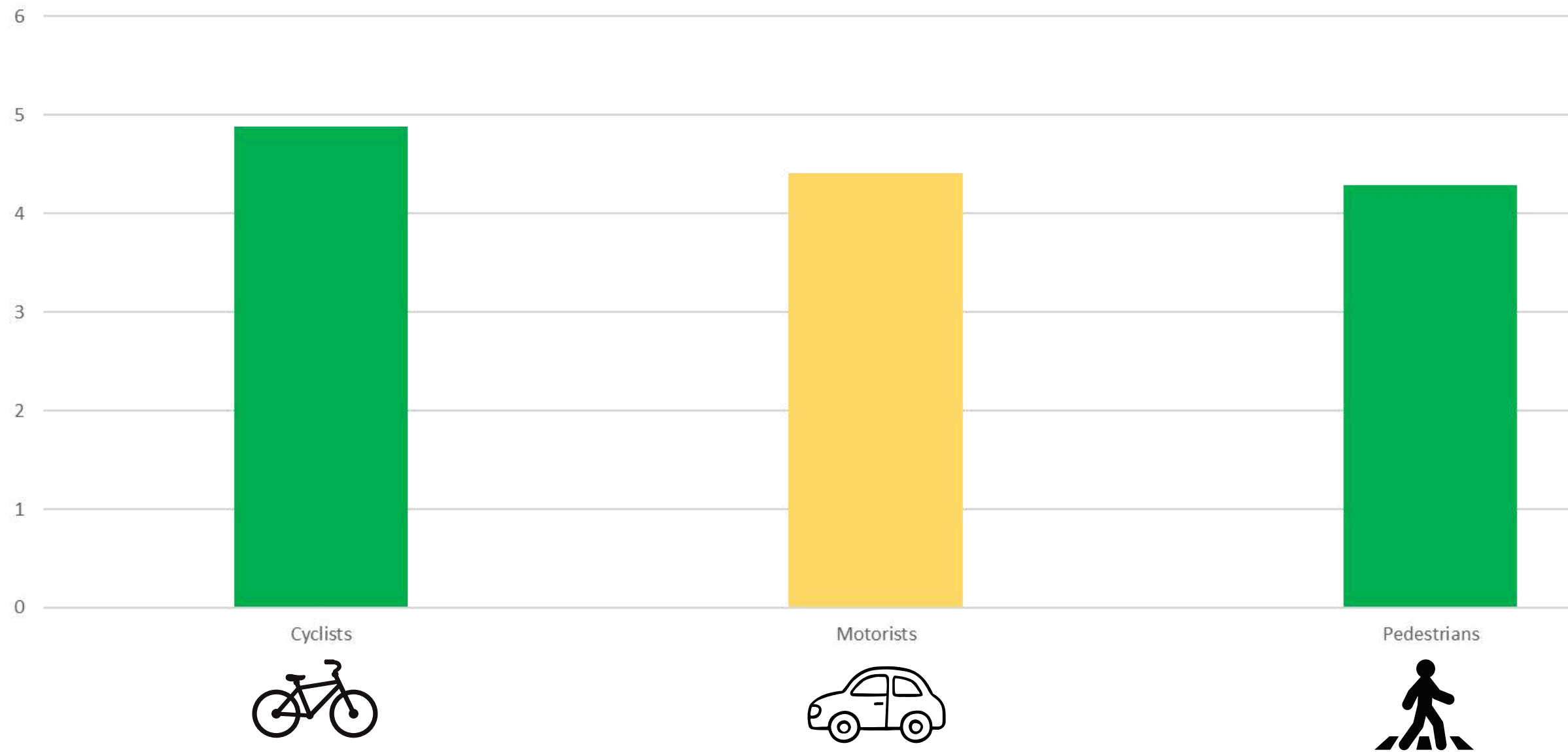
### Lane Design Preference for Pedestrians





# Involvement & Support

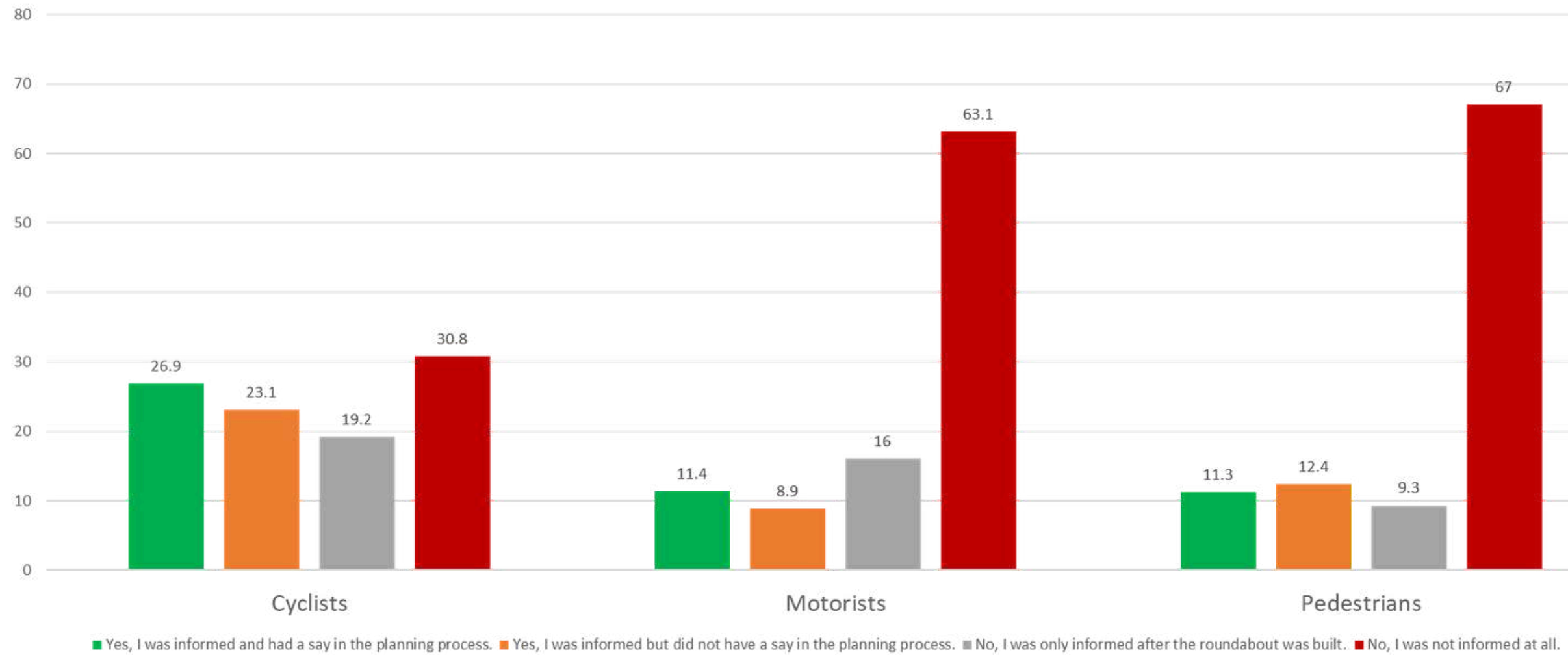
### Support Roundabouts Construction



- Green bar is significantly higher than midpoint.
- Pedestrians and Cyclist are likely to support Roundabouts

4. PUBLIC SENTIMENT

### Involvement in Planning of a Roundabout

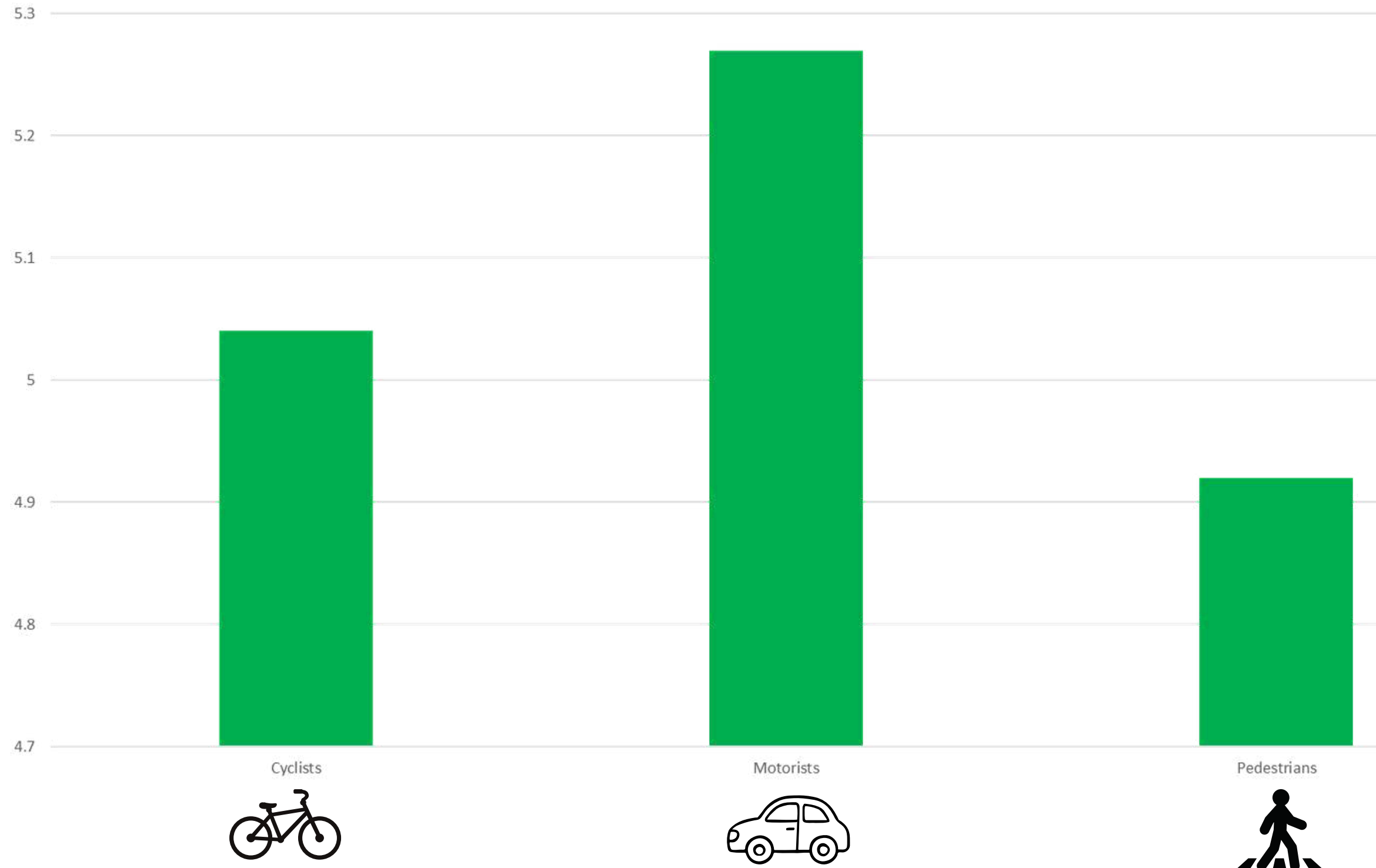


- Majority of users were not informed about roundabout implementation





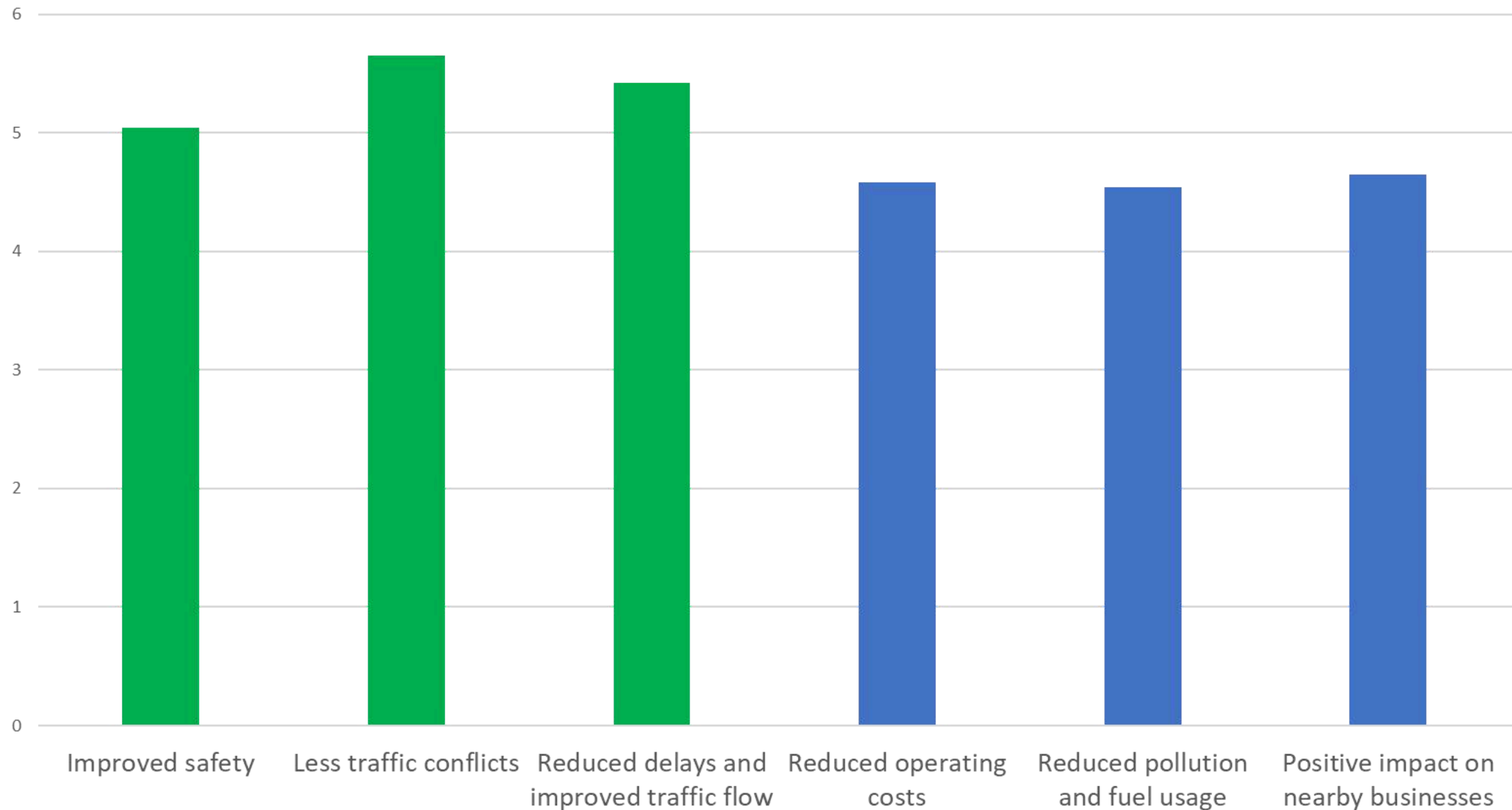
### Perceived Safety of Roundabouts



4. PUBLIC SENTIMENT

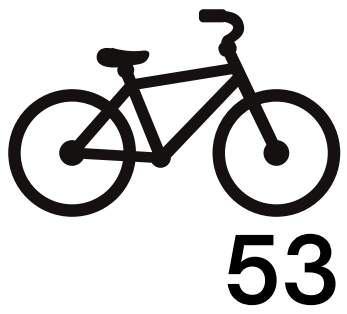
- Most are higher than the midpoint of the scale (4), 1-7 scale
- **Green bar** is significantly higher than midpoint.
- Motorists have highest perceived safety of roundabouts

### Cyclists' Perceived Importance of Roundabouts' Benefits

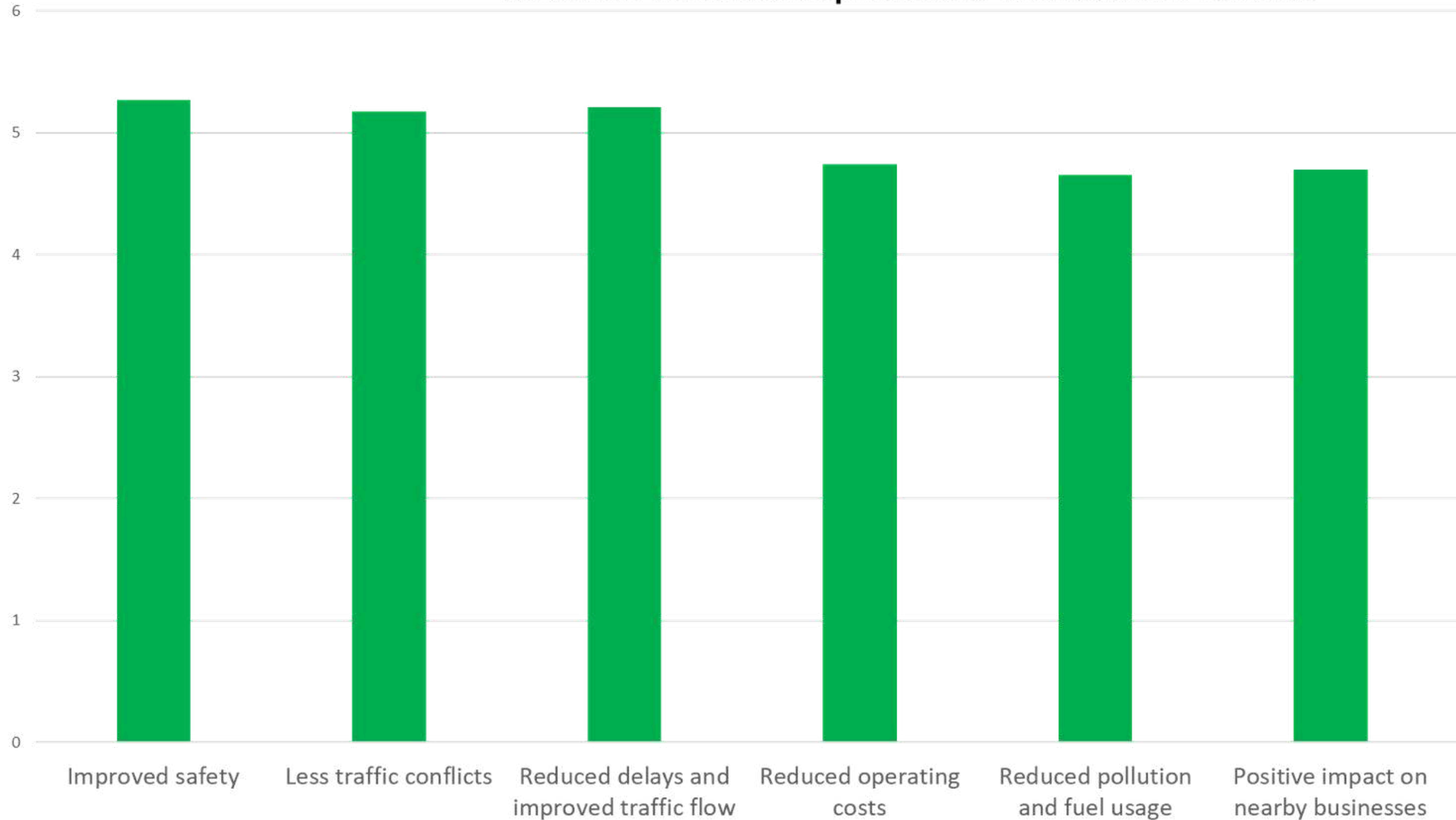


4. PUBLIC SENTIMENT

- Most are higher than the mid-point of the scale (4), 1-7 scale
- **Green bar** is significantly higher than midpoint.
- Cyclists find that free flow, less accidents and better safety to be important

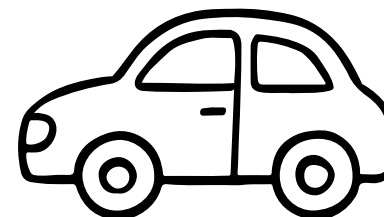


### Motorists' Perceived Importance of Roundabouts' Benefits

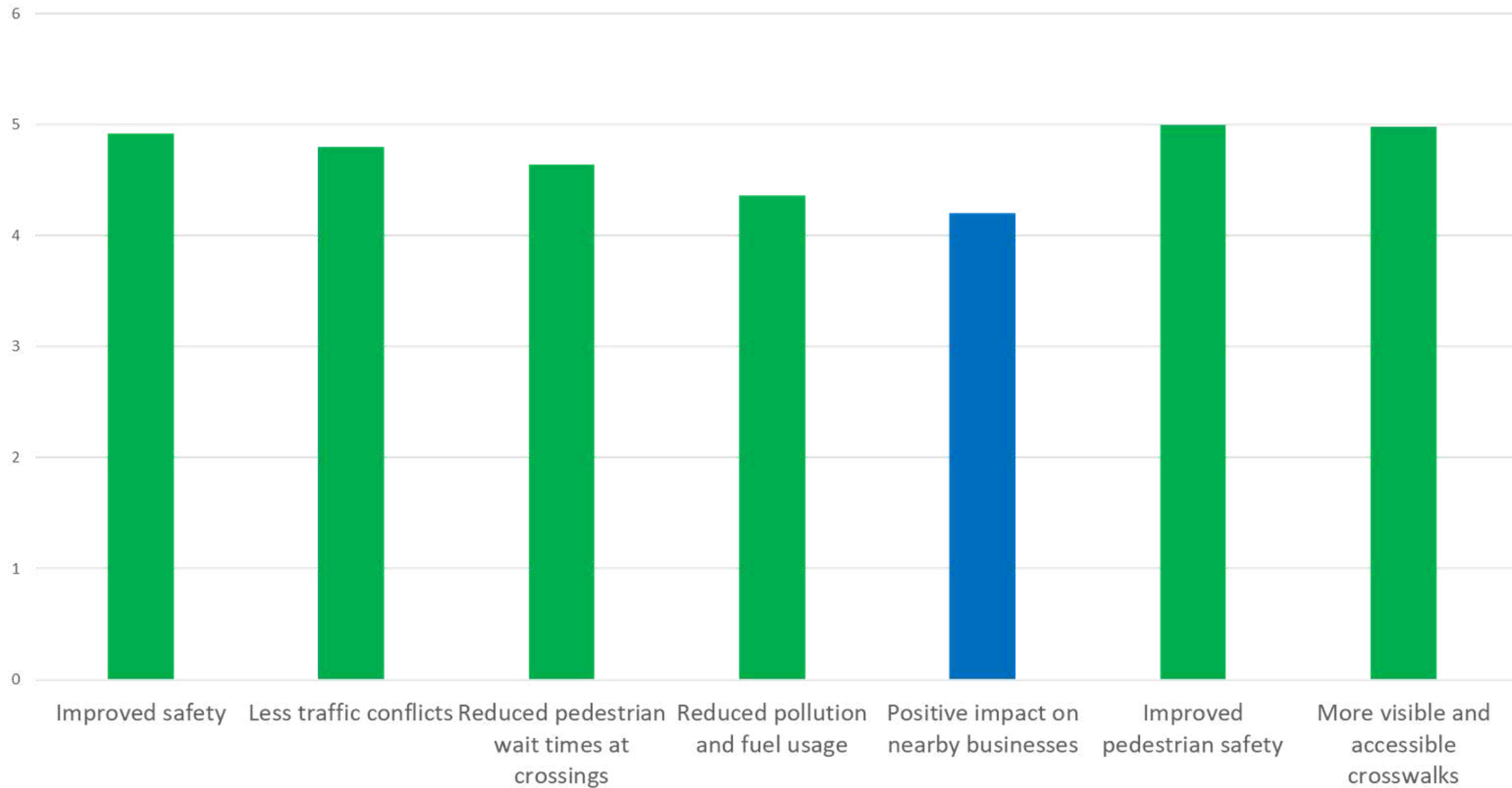


- Higher than the mid-point of the scale (4), 1-7 scale
- **Green bar** is significantly higher than midpoint.
- Motorists find all points to be benefits

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### Pedestrians' Perceived Importance of Roundabouts' Benefits



- All Significantly higher than the mid-point of the scale (4), 1-7 scale, Except Positive impact on nearby businesses
- **Green bar** is significantly higher than midpoint.

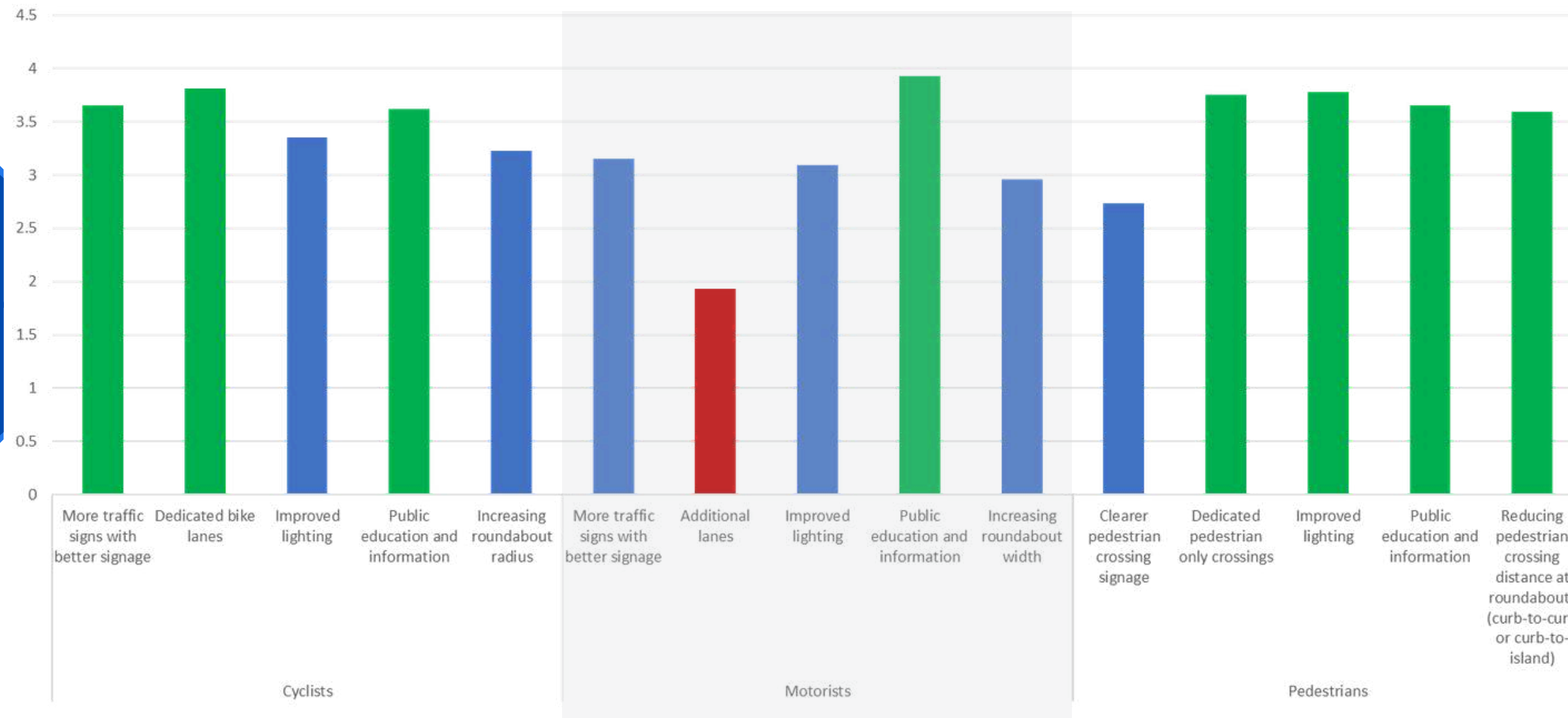
4. PUBLIC SENTIMENT



A collage of business-related items including a keyboard, glasses, a notebook, a pen, and various charts and diagrams. The items are arranged in a layered, overlapping fashion, creating a sense of a busy, organized workspace. The overall color palette is muted, with shades of blue, grey, and white.

# Recommended Improvements

### Importance of Suggested Improvements to Roundabouts



- All scores are above the midpoint (3 on a 1-5 scale)
- **Green bar** is significantly higher than midpoint.
- All modes agree improvements on education and usage on roundabouts is necessary

4. PUBLIC SENTIMENT



# Section 2: Business Survey

# Business Sample Design Framing

**INTRODUCTION**

**BUISNESS INFORMATION**

**STATUS BEFORE  
ROUNDAABOUT**

**STATUS AFTER  
ROUNDAABOUT**

**OVERALL IMPACT**



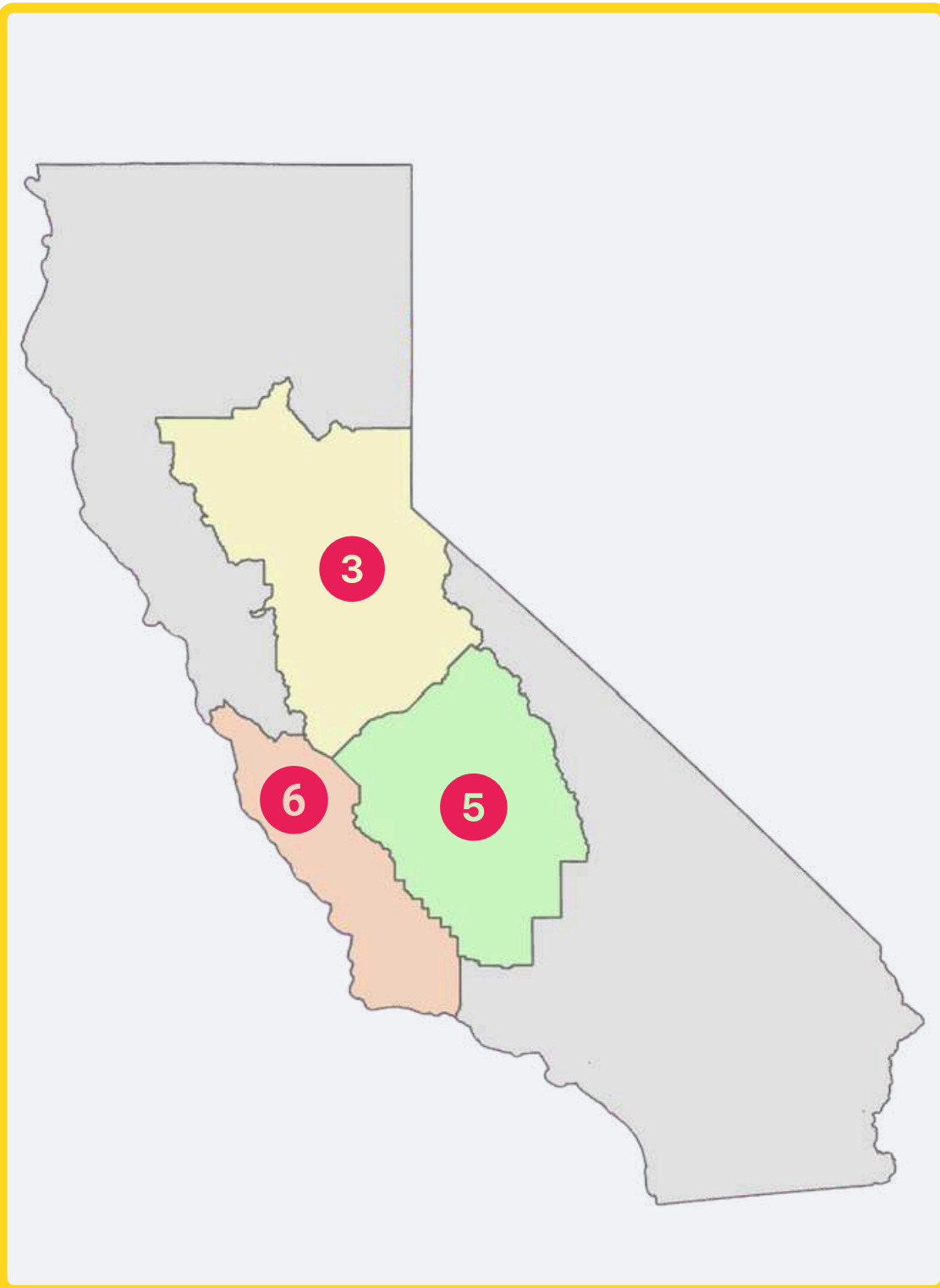
**TO VIEW SURVEY  
SCAN ME**

**Evaluate business owner sentiment:**

- Visibility
- Traffic Flow
- Loading & Deliveries
- Accessibility
- Business Performance
- Foot Traffic

\*Distributed In Person

# Buisness Sample Framing



**3 Regions**

**250' Radius Urban**

**500' Radius Sub-Urban**

**151 Interviews**

- 1 North California
- 2 Bay Area
- 3 Sacramento **66**
- 4 Mountains
- 5 San Joaquin Valley **43**
- 6 Central Coast **41**
- 7 South California

# Business Sample Framing

Region 1,2,3

Rural  
50%

Urban  
50%

Single Lane

Multi-Lane

Single Lane

Multi-Lane

\*3-4 businesses each

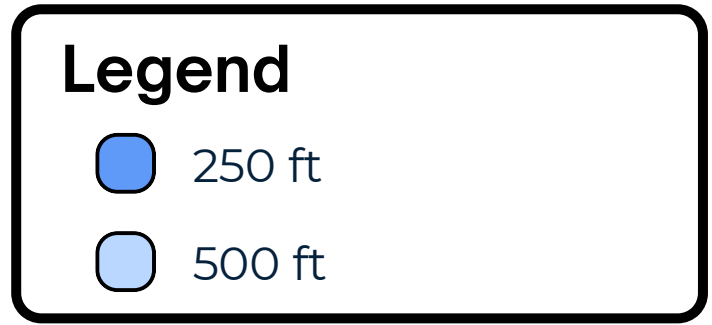
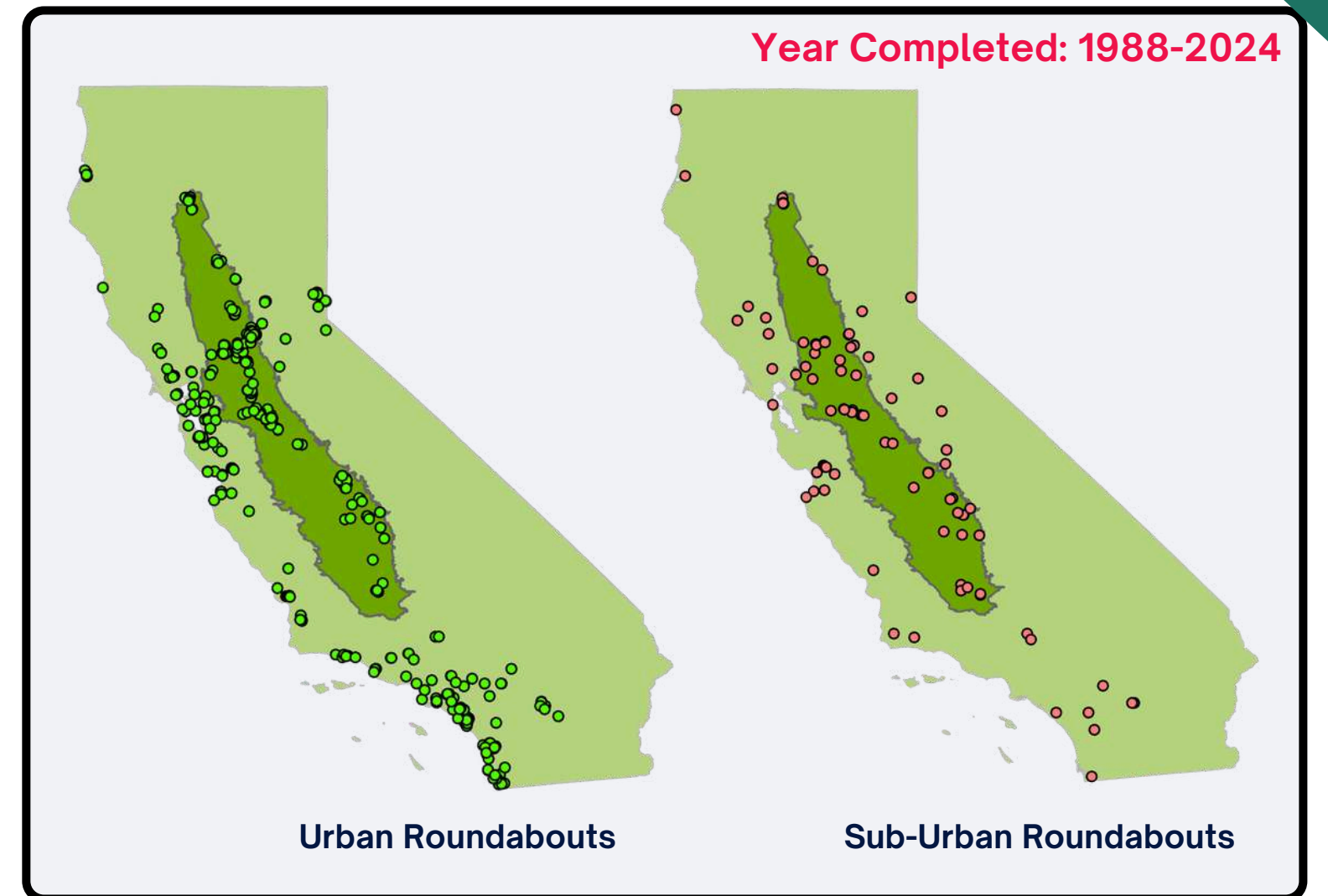
# Business Sample Design Framing

1. Roundabouts data  
○ Kittelson's

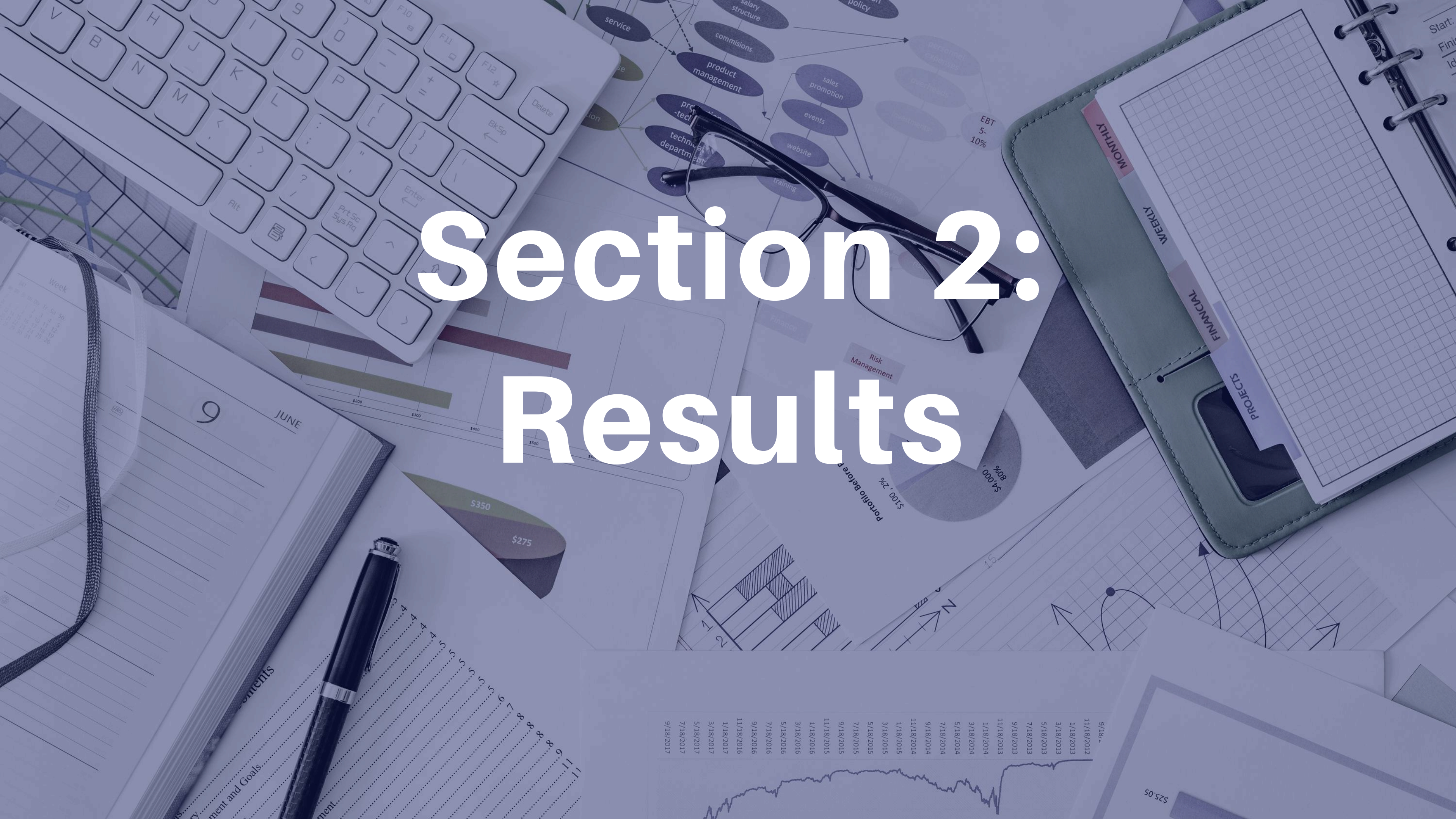
2. Urban classification data  
○ TIGER

3. Business's in California data  
○ OpenStreetMap

5. BUSINESS SENTIMENT



# Section 2: Results



# Business Survey Sections

1

**Sample Characteristics**

5

**Pre & Post-Roundabout Impact**

2

**Roundabout Perceptions**

6

**Single-Lane vs. Multi-Lane**

3

**Likelihood to Support**

7

**Rural vs. Urban Roundabouts**

4

**Involvement in Planning**

8

**Conclusion**

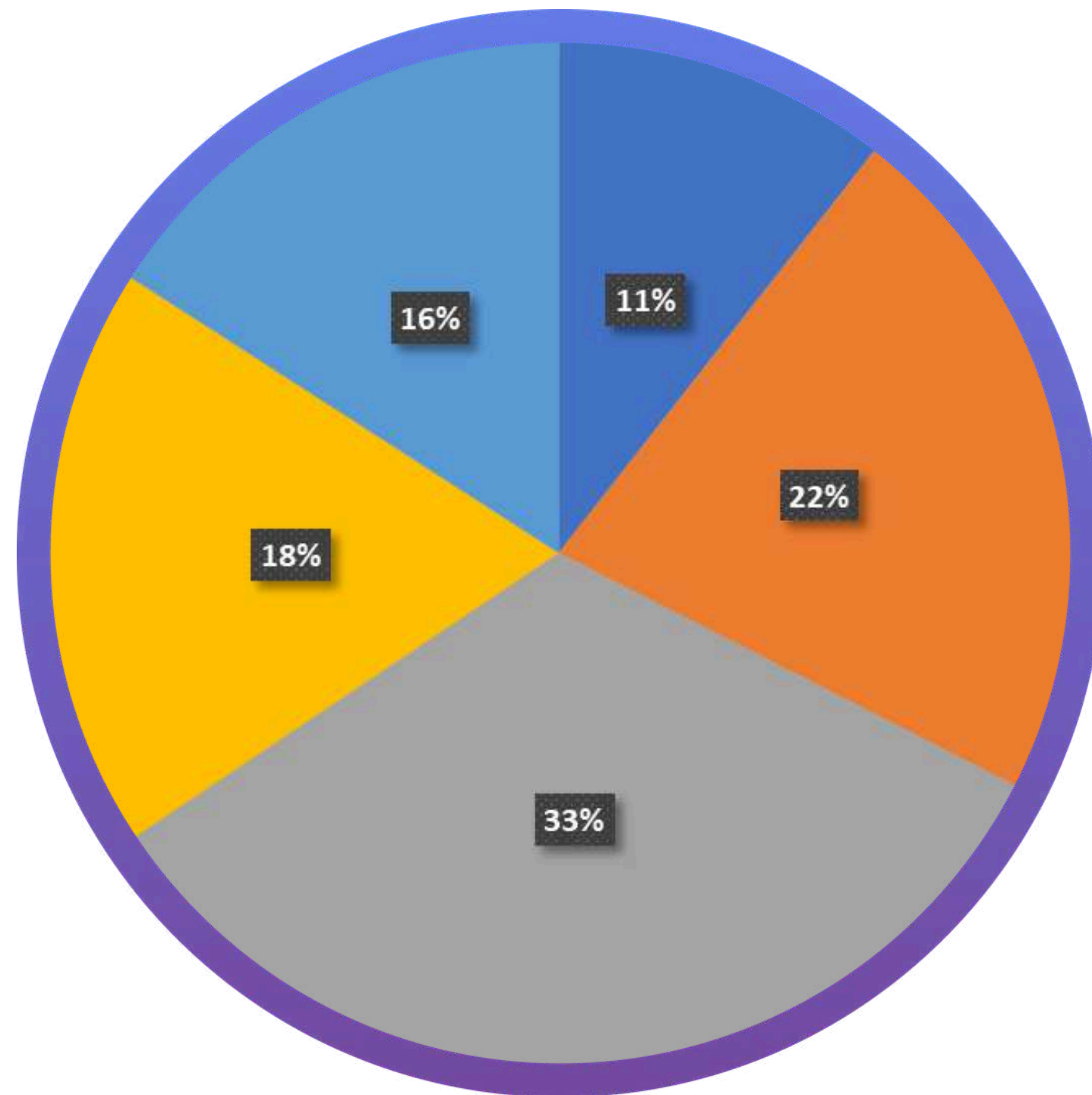


# Sample Characteristics

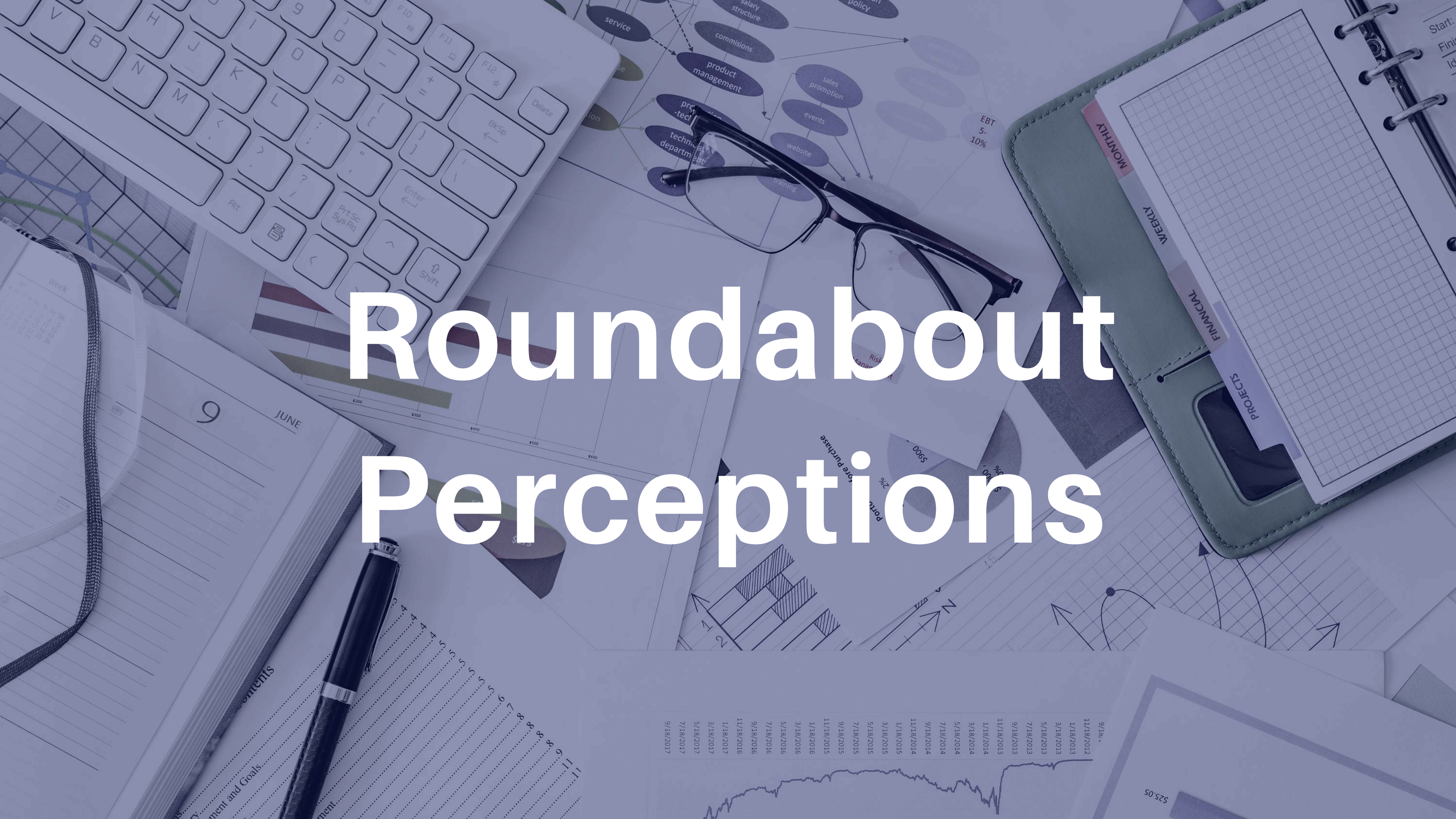
# Collected Data - 151 Surveys

- **Region**
  - Central Valley: 43 (28%)
  - Coast: 42 (28%)
  - Sacramento: 66 (44%)
- **Urban vs. Rural**
  - Urban: 102 (67.5%)
  - Rural: 49 (32.5%)
- **Single vs. Multi-Lane**
  - Single: 95 (63%)
  - Multi-Lane: 56 (37%)

# Type of Business

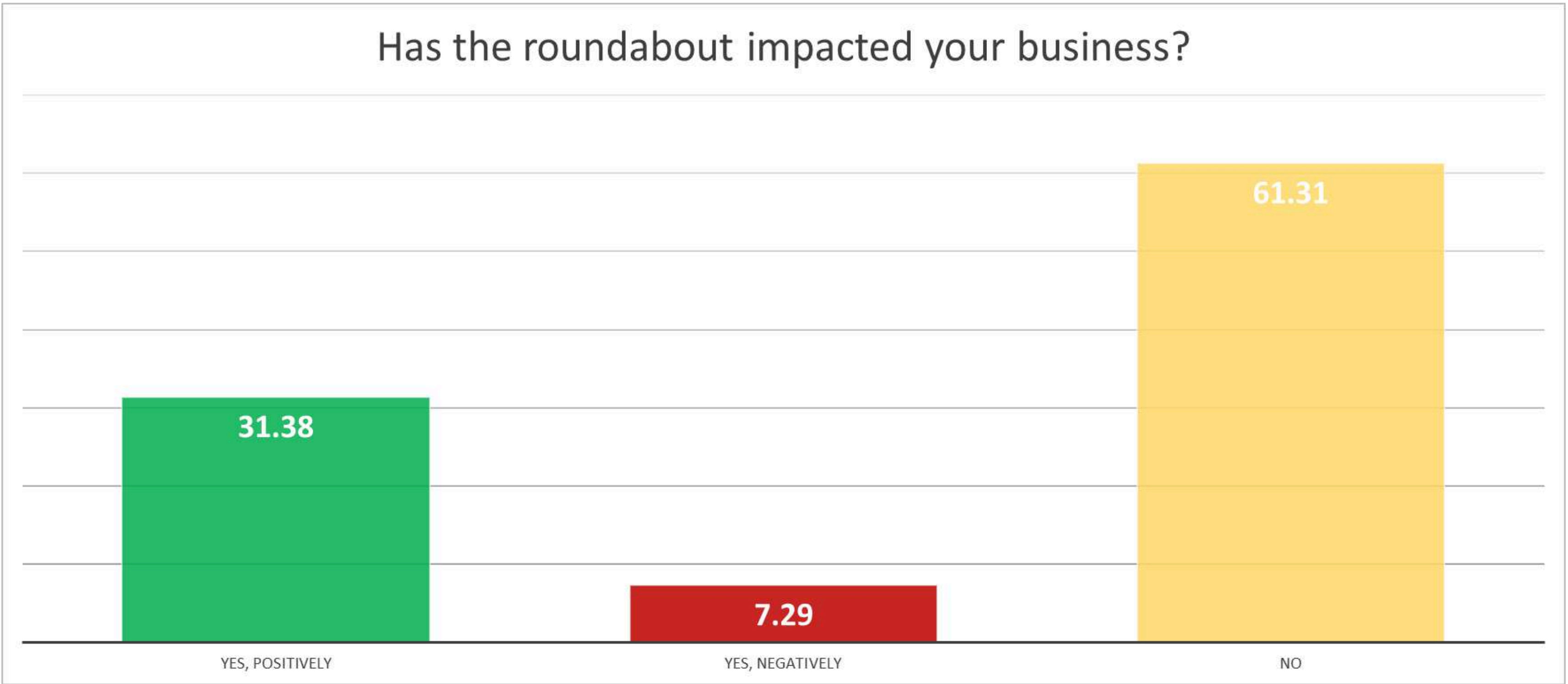


- Destination business (e.g., offices, clinics, gyms)
- Pass-by business (e.g., gas stations, cafes, fast food)
- Retail store (e.g., clothing, groceries)
- Service-oriented business (e.g., salons, repair shops)
- Other



# Roundabout Perceptions

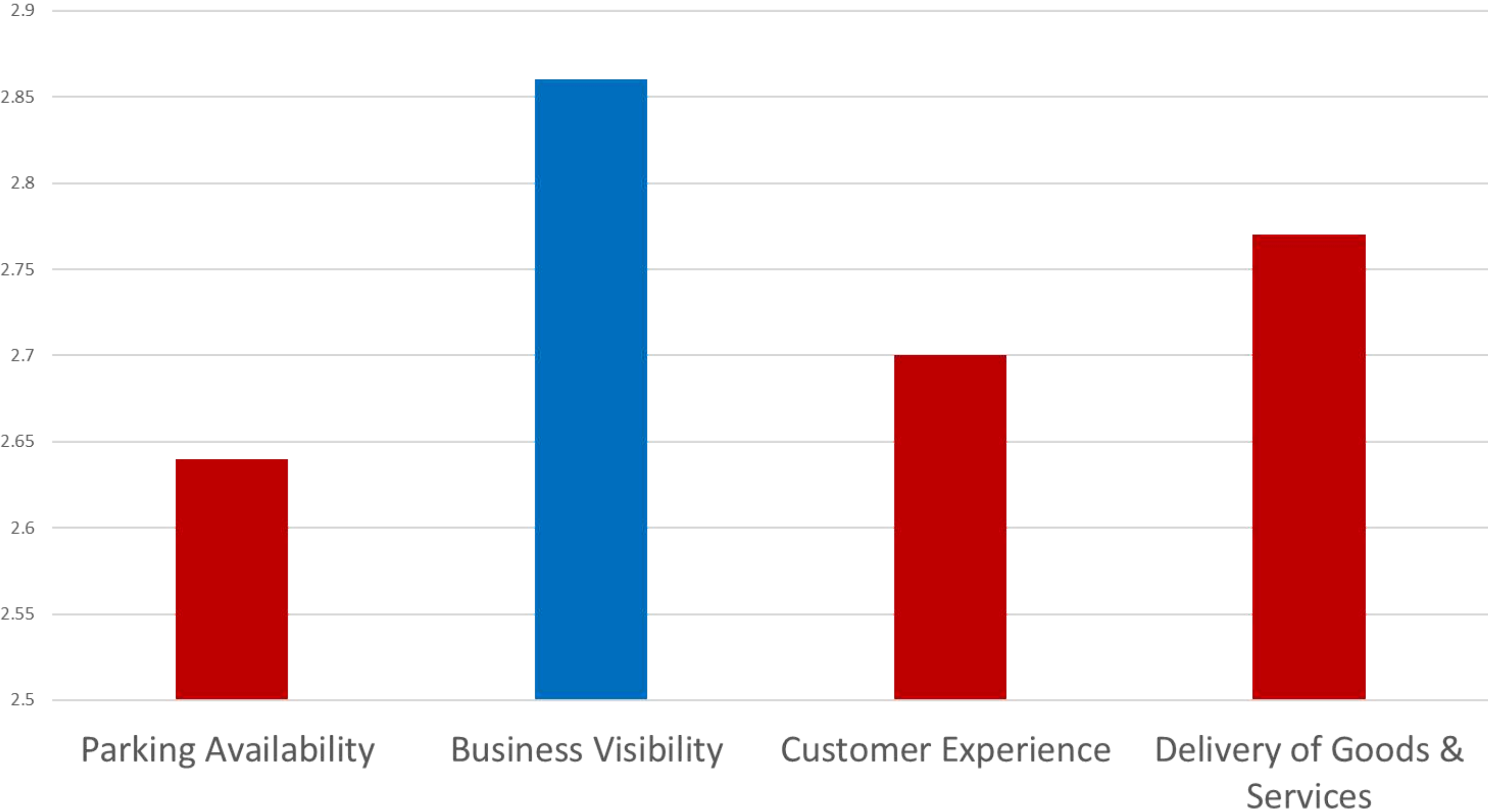
## Has the roundabout impacted your business?



5. BUSINESS SENTIMENT

# Perceived Pain Points

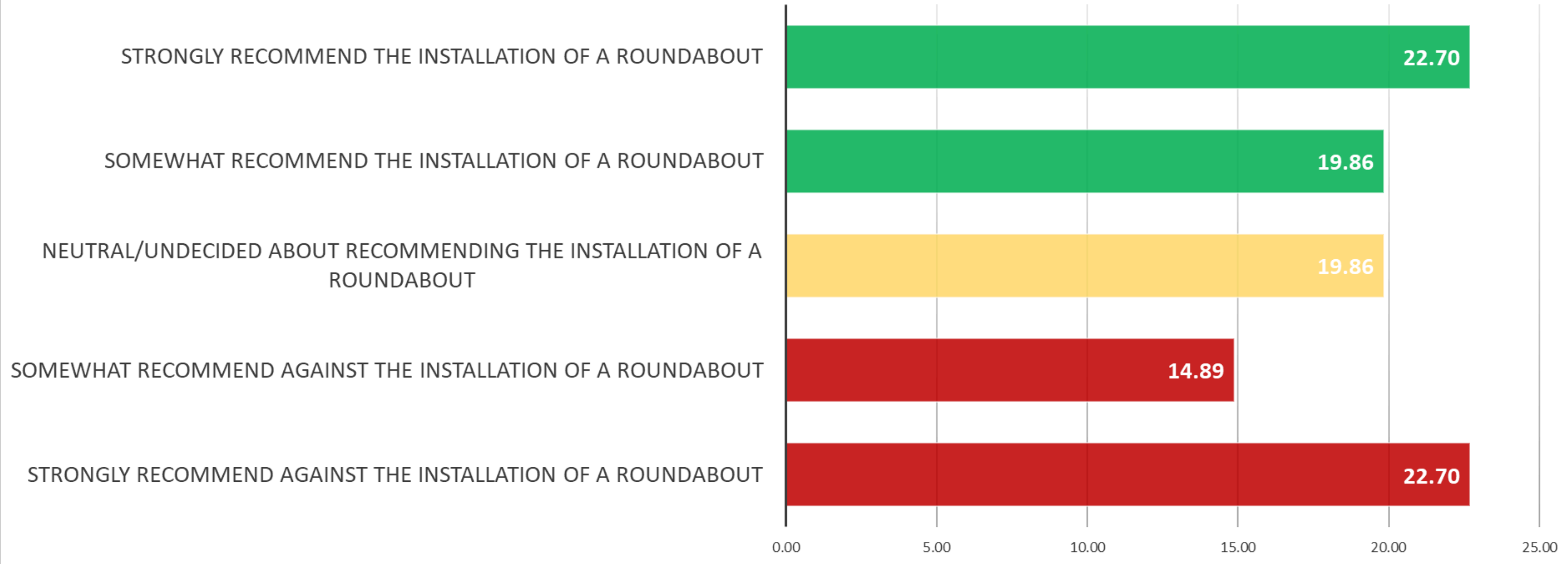
5. BUSINESS SENTIMENT





# Likelihood to Support

### Recommend Roundabout Installation



Around 43% Recommend Roundabout Installation

Around 20% are neutral

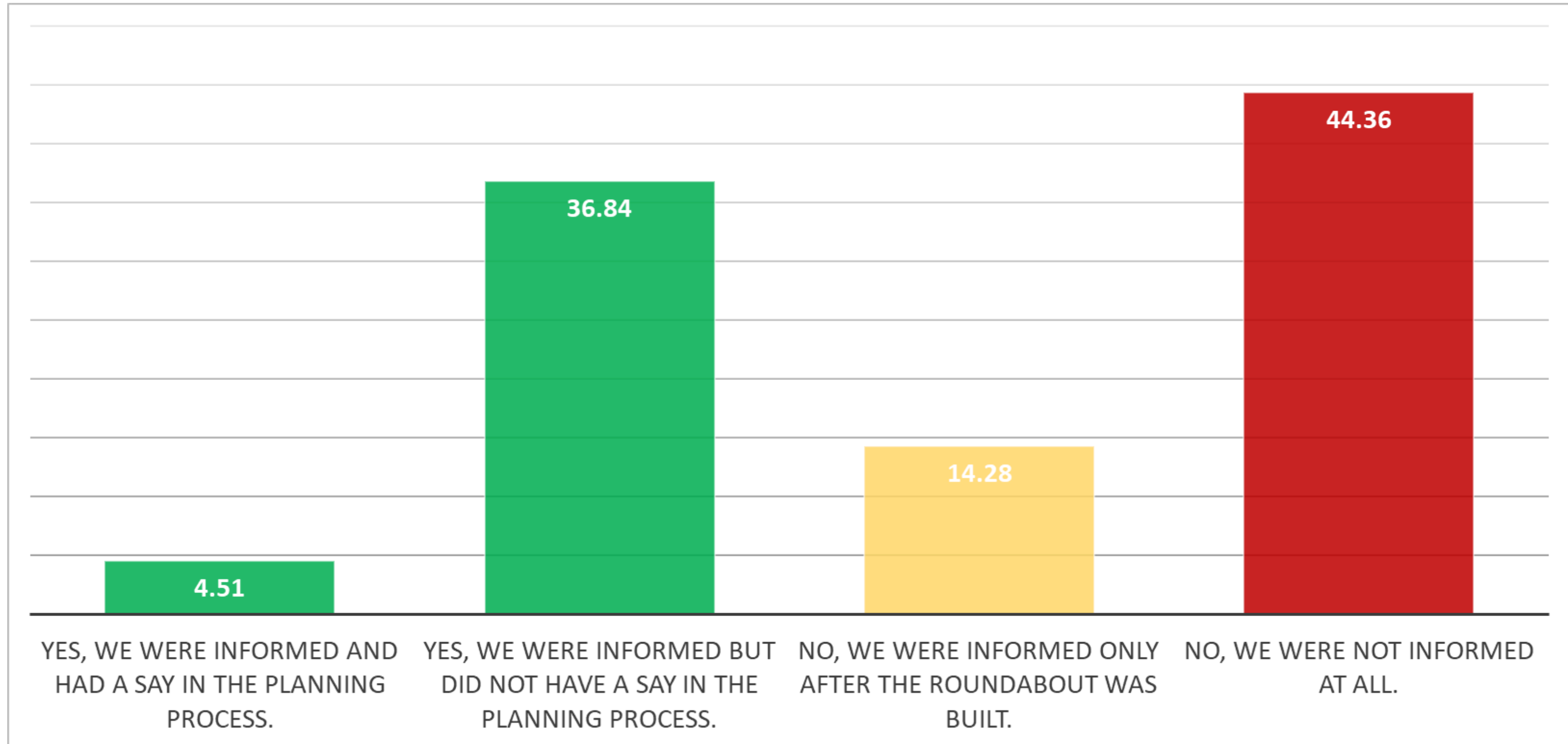
Around 37% Recommend Against Roundabout Installation

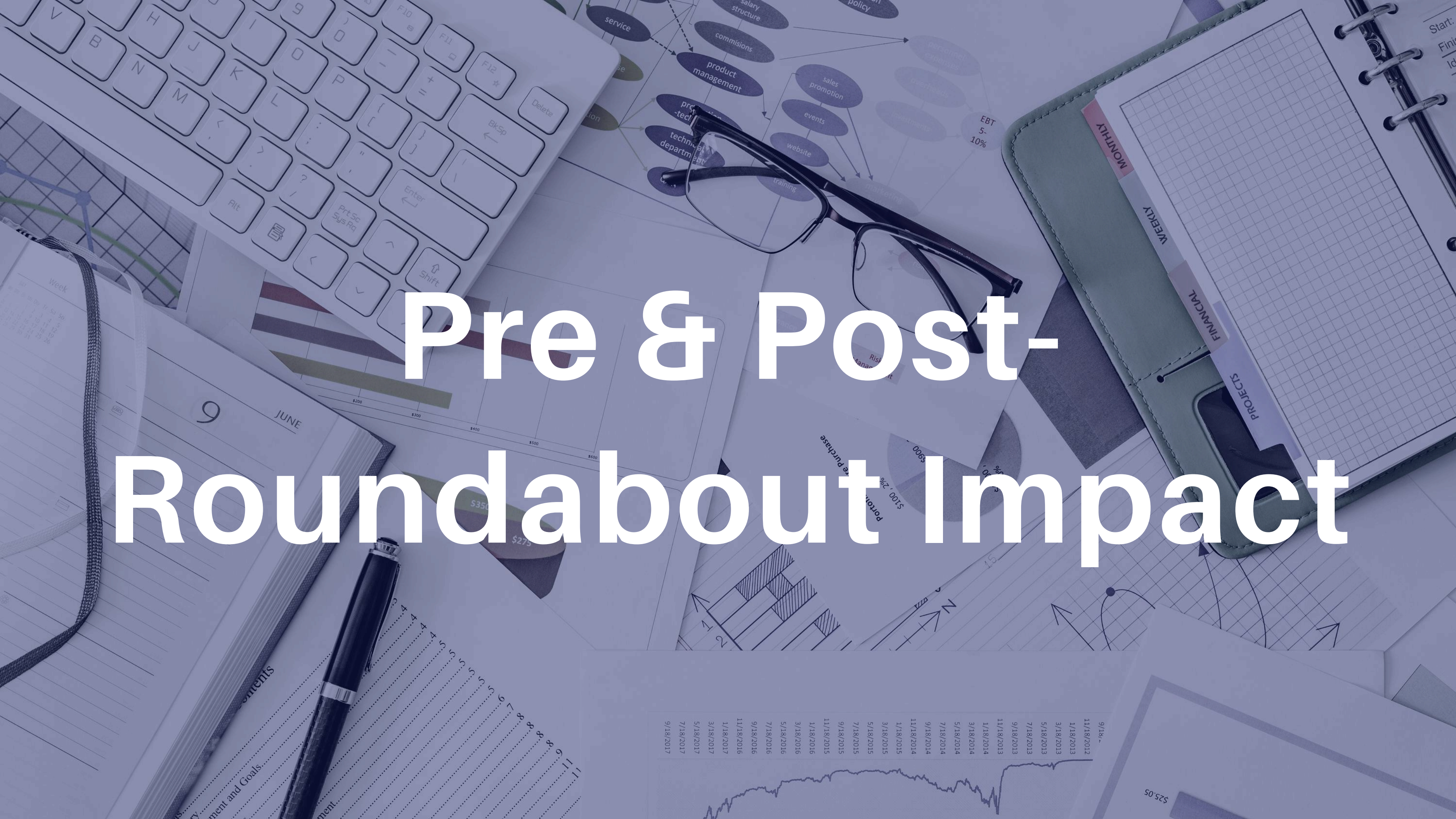


# Involvement in Planning

# Roundabout Planning Involvement

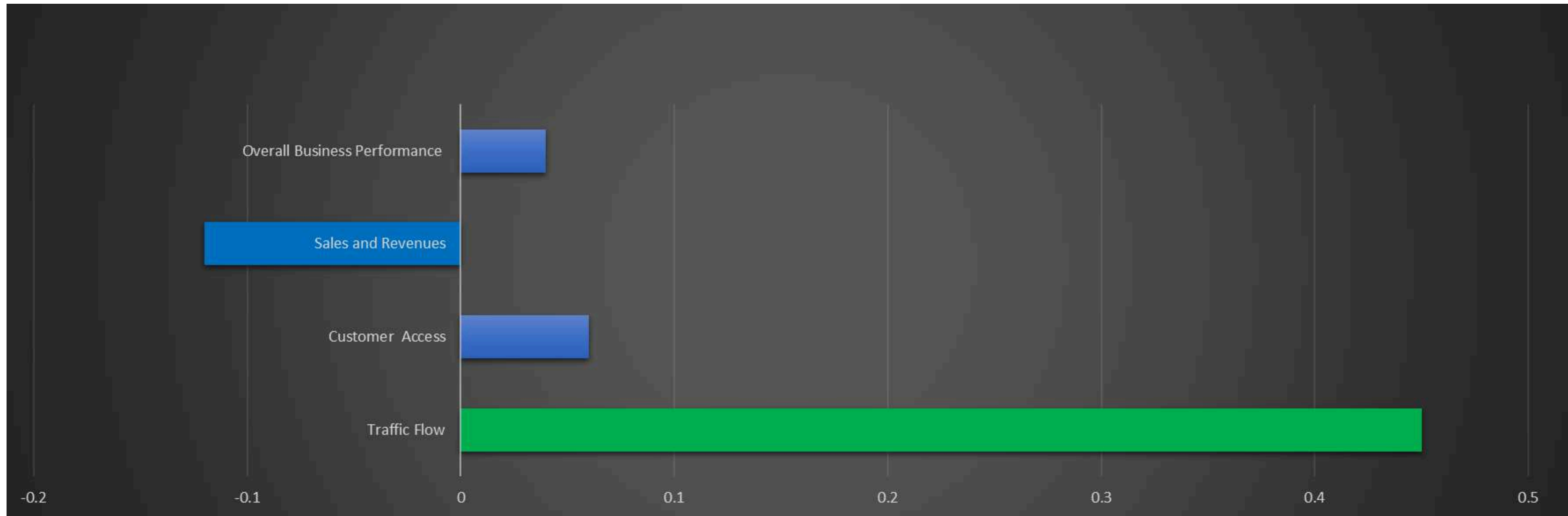
5. BUSINESS SENTIMENT





# Pre & Post- Roundabout Impact

# Roundabout Implementation Affects



5. BUSINESS SENTIMENT

- Significant enhancement in traffic flow
- No significant difference in Sales and Revenues, Customer Access, and Business Performance



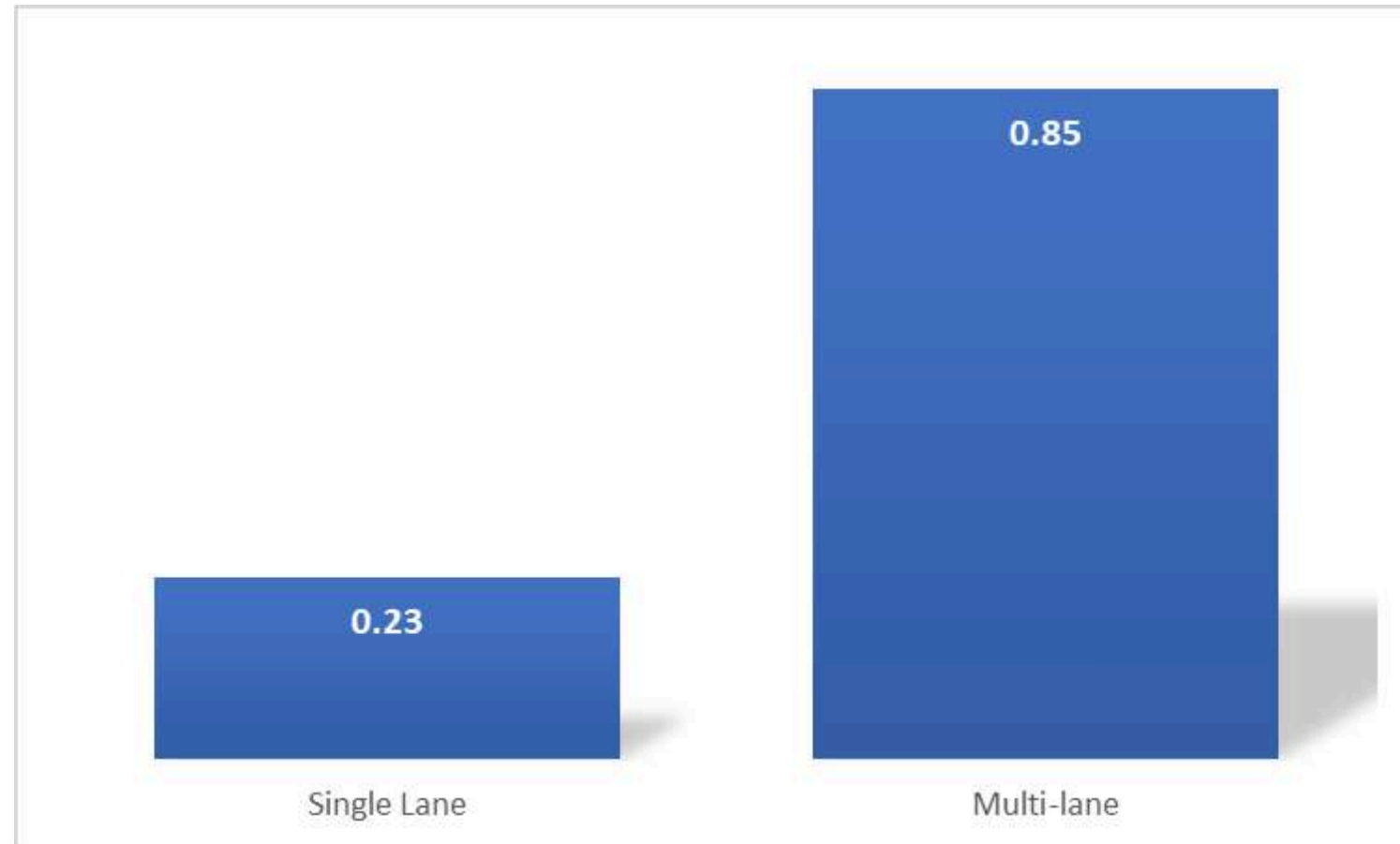
# Single-Lane vs. Multi-Lane

# Single-Lane vs. Multi-Lane

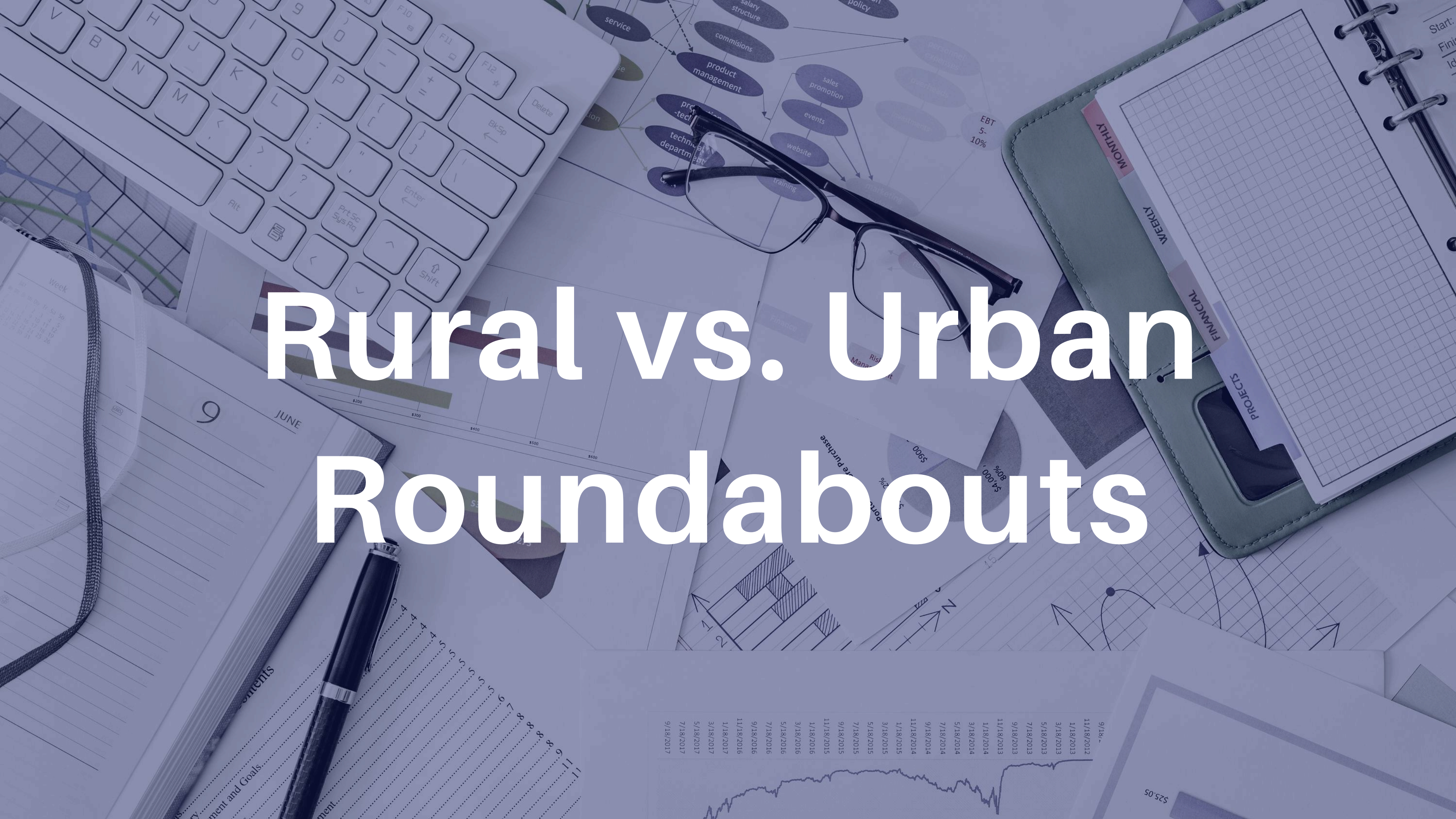
- No Significant Differences on:
  - Business Owner and employee access
    - Customers' Access
    - Parking Availability
    - Business Visibility
    - Delivery of Goods and Services
    - Overall Customer Experience
    - Likelihood to recommend the construction of Roundabouts

# Single-Lane vs. Multi-Lane

Before and after roundabout implementation comparison  
Significant difference in enhancement in traffic flow



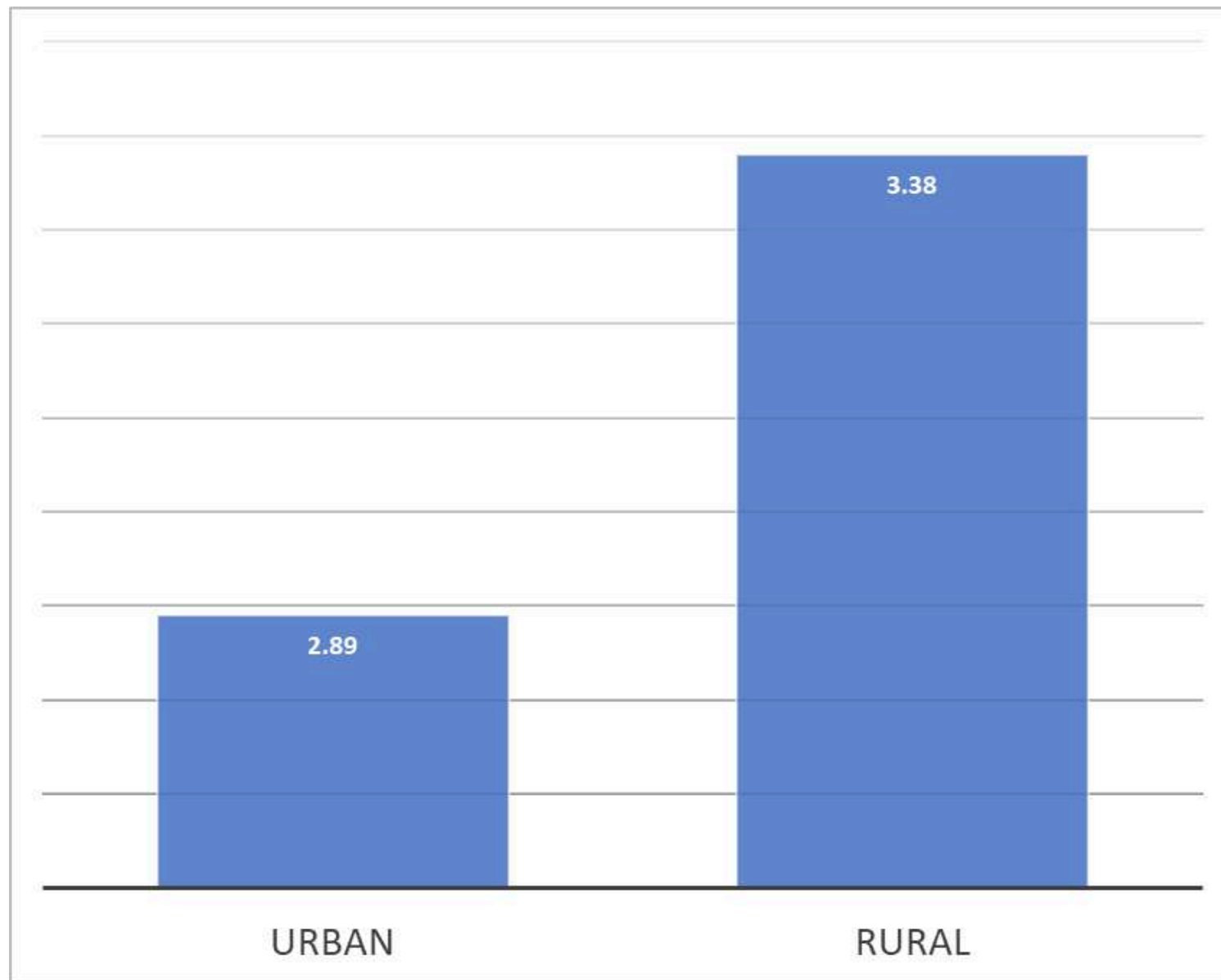
No significant difference in Customer Access, Sales & Revenues, and Business performance

A collage of business-related items including a keyboard, glasses, a notebook, and various charts and documents. The background is a light blue overlay. The text "Rural vs. Urban Roundabouts" is centered in white. The collage includes a white keyboard, a pair of black-rimmed glasses, a green notebook with a grid pattern and tabs labeled "MONTHLY", "WEEKLY", "FINANCIAL", and "PROJECTS", a line graph, a bar chart, a pie chart, and various documents with text and diagrams. The text "Rural vs. Urban Roundabouts" is centered in white. The collage includes a white keyboard, a pair of black-rimmed glasses, a green notebook with a grid pattern and tabs labeled "MONTHLY", "WEEKLY", "FINANCIAL", and "PROJECTS", a line graph, a bar chart, a pie chart, and various documents with text and diagrams.

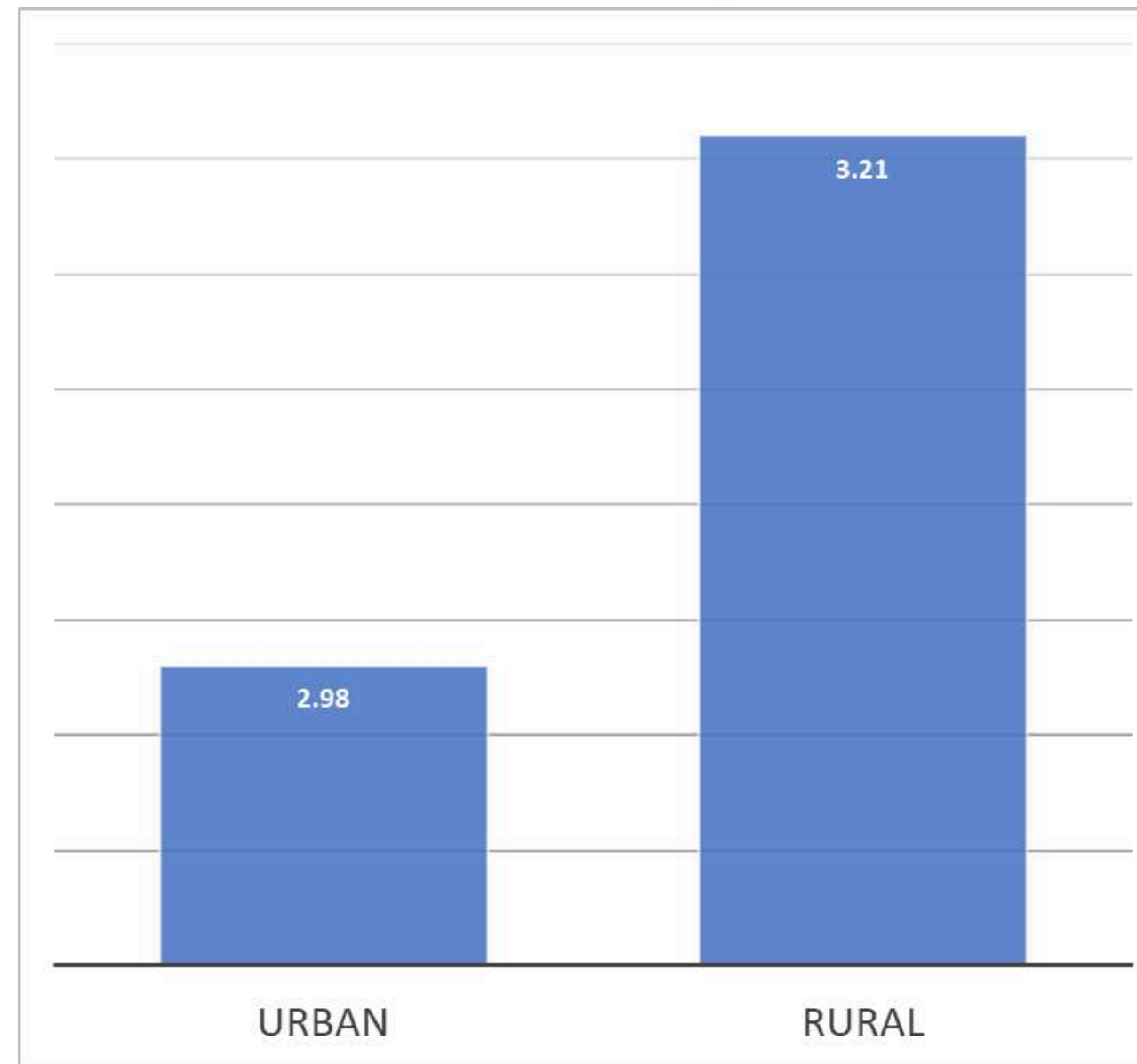
# Rural vs. Urban Roundabouts

# Rural vs. Urban

Likelihood to recommend the construction of Roundabouts



Overall Customer Experience



5. BUSINESS SENTIMENT

# Rural vs. Urban

- No Significant Differences on:
  - Business Owner and employee access
    - Customers' Access
    - Parking Availability
    - Business Visibility
    - Delivery of Goods and Services
    - Sales & Revenues
    - Business performance
    - Traffic flow

A hand is shown holding a small piece of paper in front of a chalkboard. On the chalkboard, a speech bubble is drawn with white chalk, and inside the bubble, numerous pieces of paper are scattered, representing a collection of messages or content. The background is a dark blue chalkboard.

# Message Content

# Message Objectives & Approach

## Message Objectives:

- Enhance Safety Behaviors at Roundabouts
- Increase Overall Acceptance of Roundabouts

## Message Approach:

- Address Main Concerns of each segment of road users  
(Motorists, Pedestrians, and Cyclists)

# Message Content

## For Pedestrians:

- Highlight the presence of signage
- Emphasize waiting for vehicles to stopping at crosswalks

## For Cyclists:

- Emphasize watching for vehicles before entering a roundabout

## For Motorists:

- Emphasize stopping at crosswalks
- Highlight watching for vehicles before entering a roundabout



# Message Framing

# Vulnerable vs. Non-Vulnerable Road Users

- Prevention-Focused Message (Non-Vulnerable Road Users)

**DO NOT WASTE A LIFE**

- Promotion-Focused Message (Vulnerable Road Users)

**Save A LIFE**

# Age Differences

- Younger Adults < 55 (Rational Message)

**76% Reduction in Injury**  
**90% Reduction in Fatal Accidents**

- Older Adults 55+ (Emotional Message)

**7 out of 10 are saved from injuries**  
**9 out 10 are saved from death**

# Example of a Message to Motorists above 55

**Roundabouts allow more people to return safely to their beloved ones**

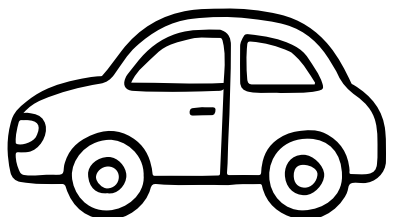
**7 out of 10 are saved from injuries**

**9 out 10 are saved from death**

**Stop at crosswalks**

**Watch for other vehicles before entering a roundabout**

**Save A LIFE**



# Example of a Message to Motorists below 55

**Roundabouts enhance traffic safety statistics, leading to**

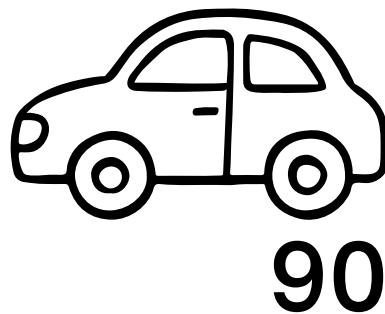
**76% Reduction in Injury**

**90% Reduction in Fatal Accidents**

**Stop at crosswalks**

**Watch for other vehicles before entering a roundabout**

**Save A LIFE**



# Example of a Message to Cyclists above 55

**Roundabouts allow more people to return safely to their beloved ones**

**7 out of 10 are saved from injuries**

**9 out 10 are saved from death**

**Watch for vehicles before entering a roundabout**

**Do Not Waste A LIFE**



# Example of a Message to Cyclists below 55

**Roundabouts enhance traffic safety statistics, leading to**

**76% Reduction in Injury**

**90% Reduction in Fatal Accidents**

**Watch for vehicles before entering a roundabout**

**Do Not Waste A LIFE**



# Example of a Message to Pedestrians above 55

**Roundabouts allowed more people to return safely to their beloved ones**

**7 out of 10 are saved from injuries**

**9 out 10 are saved from death**

**Look for pedestrians crossing signage**

**Wait for vehicles to stop at crosswalks**

**Do Not Waste A LIFE**



# Example of a Message to Pedestrians below 55

**Roundabouts enhance traffic safety statistics leading to**

**76% Reduction in Injury**  
**90% Reduction in Fatal Accidents**

**Look for pedestrians crossing signage**  
**Wait for vehicles to stop at crosswalks**

**Do Not Waste A LIFE**



## Closing Remarks

# MOVING TOWARDS

Roundabouts in California

### FSTI TEAM

Dr. Aly Tawfik

Dr. Samer Sarofim

Alexis Perez

### CALTRANS TEAM

John Liu

Edwin Yeung



# THANK YOU QUESTIONS?

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559.278.8791

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TO LEARN MORE  
SCAN ME