Lessons from the Green Lanes:
Evaluating Protected Bike Lanes

http://bit.ly/nitc_583

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Pro Walk Pro Bike Pro Place
Pittsburgh, PA
September 9, 2014

Photo credit: Nathan McNeil, PSU

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Session Overview

1. Overview of Sites (Chris)   10
2. Methodology (Nathan)   5
3. Change in Ridership (Jennifer)   15

   Questions from audience

4. Design (Chris)   25

   Questions from audience

6. Barrier types (Nathan)   5
7. Community Support (Jennifer)   10

   Questions from audience

Portland State UNIVERSITY

NITC NATIONAL INSTITUTE for TRANSPORTATION and COMMUNITIES

THE SUMMIT FOUNDATION

peopleforbikes™

Research Objectives

- A field-based evaluation of protected bikeways in five U.S. cities to study:
  - Safety of users (both perceived and actual)
  - Effectiveness of the design
  - Perceptions of residents and other road users
  - Attractiveness to more casual cyclists
  - Change in economic activity
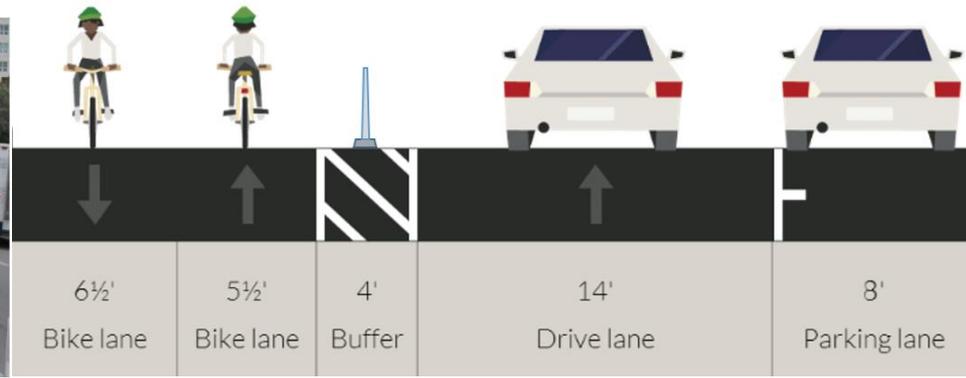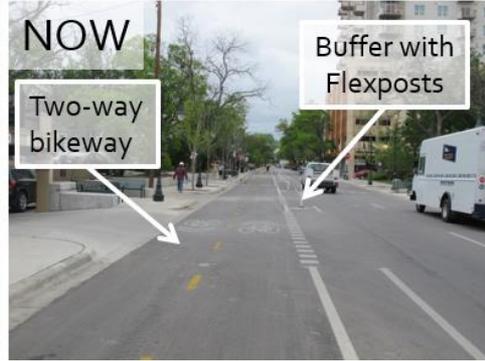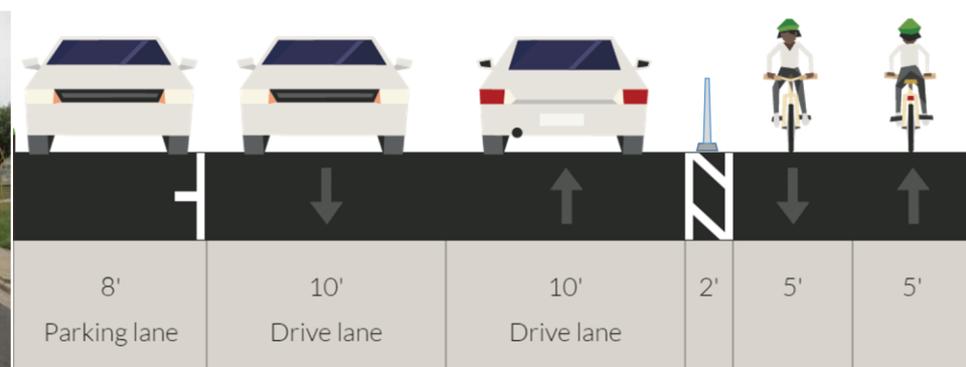
Overview of Sites

Green Lane Cities Studied

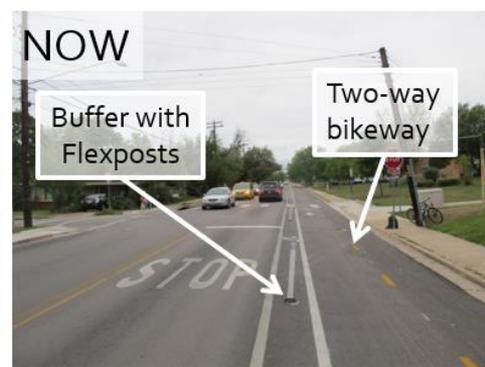

Portland, OR

San Francisco, CA

Chicago, IL

Washington, DC

green |||| lane
PROJECT

Austin, TX

Study Facilities: Austin

Rio Grande Street

BEFORE (Image: Google Street View)

NOW — Two-way bikeway — Buffer with Flexposts

| 6½' Bike lane | 5½' Bike lane | 4' Buffer | 14' Drive lane | 8' Parking lane |

Bluebonnet Lane

BEFORE (Image: Google Street View)

NOW — Buffer with Flexposts — Two-way bikeway

| 8' Parking lane | 10' Drive lane | 10' Drive lane | 2' | 5' | 5' |

Barton Springs Road

BEFORE (Images: City of Austin)

NOW — Buffer with Flexposts — Bike Lane

| 4' | 4' | 4' | 10' Drive lane | 10½' Drive lane | 10' Turn lane | 10' Drive lane | 10' Drive lane | 1½' | 7' Bike lane |

Study Facilities: Chicago

Chicago: N/S Dearborn Street

BEFORE
(Image: Google Street View)

NOW
Two-way bikeway
Parked Cars

| 4½' | 4' | 3' | 8' Parking lane | 10' Drive lane | 9' Drive lane | 10' Parking lane |
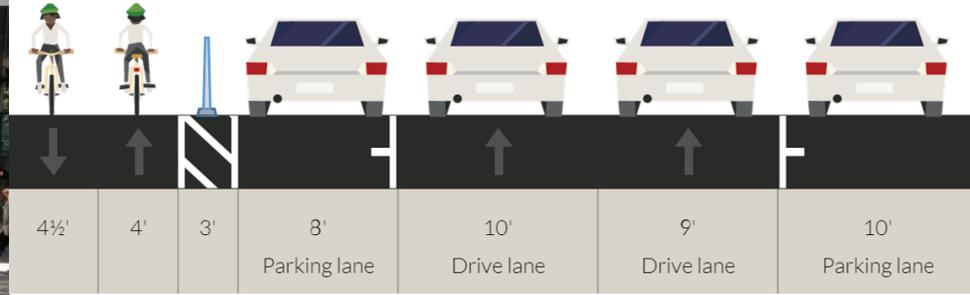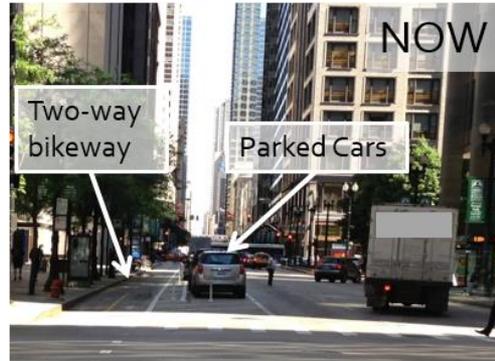
Chicago: N Milwaukee Avenue

BEFORE
(Image: Google Street View)

NOW
Bike Lane
Parked Cars

| 7' Bike lane | 3' | 11' Drive lane | 11' Drive lane | 9' Parking lane | 4' Buffer | 7' Bike lane |
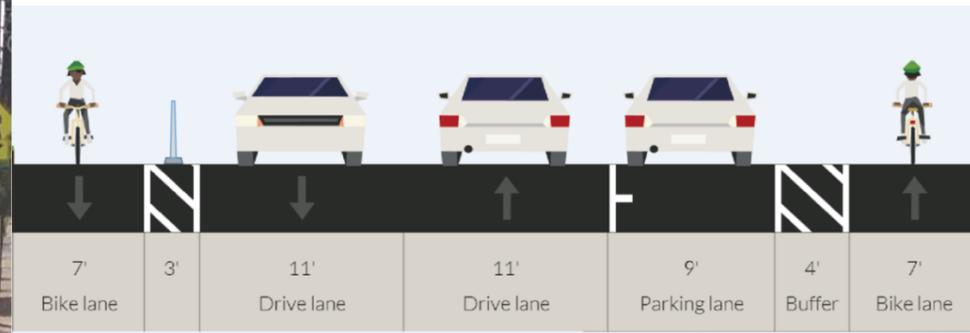
Study Facilities: Portland

Portland: NE Multnomah Street

BEFORE
(Image: Google Street View)

NOW
Buffer with Planters
Bike Lane

| 5' Bike lane | 3' | 8' Parking lane | 10' Drive lane | 9' Turn lane | 10' Drive lane | 7' Buffer | 7' Bike lane |

Study Facilities: San Francisco

SF: Fell Street

BEFORE (Image: Google Street View)

NOW — Bike Lane, Buffer with Flexposts

7¼' Bike lane	5' Buffer	9½' Drive lane	9½' Drive lane	9½' Drive lane	8' Parking lane

SF: Oak Street

BEFORE (Image: Google Street View)

NOW — Buffer with Flexposts, Bike Lane

8' Parking lane	9½' Drive lane	9½' Drive lane	9½' Drive lane	5' Buffer	7¼' Bike lane
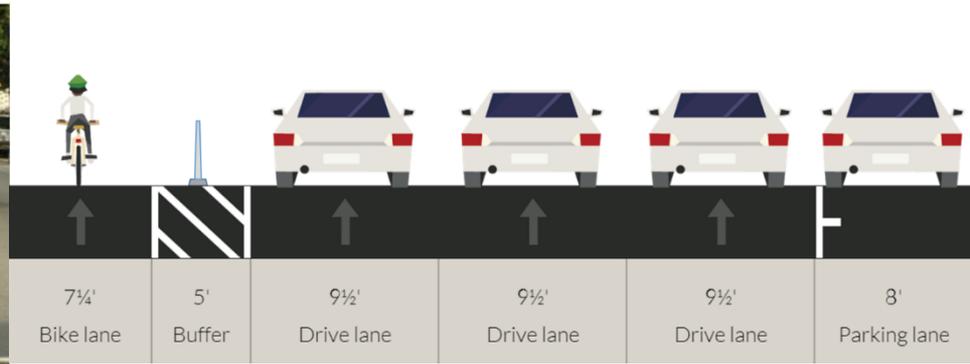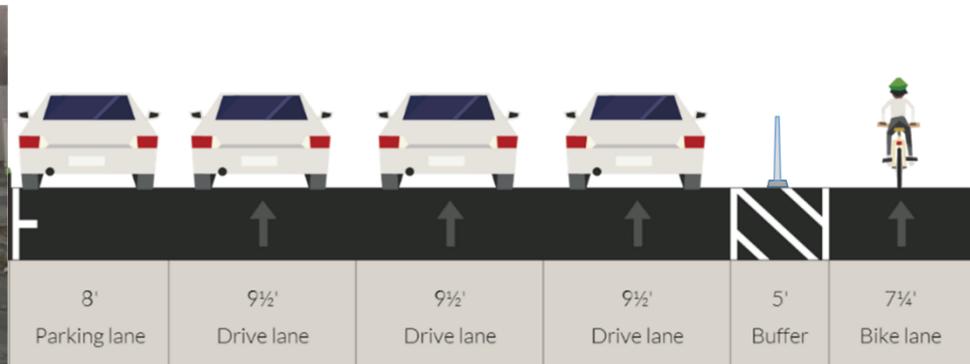
Study Facilities: Washington DC

DC: L Street

BEFORE
(Image: Google Street View)

NOW
Bike Lane
Buffer with Flexposts

8' Bike lane | 3' | 11' Drive lane | 11' Drive lane | 11' Drive lane
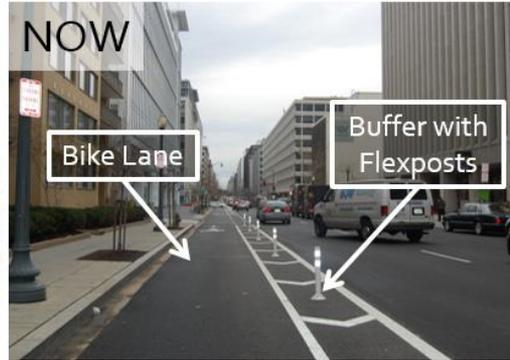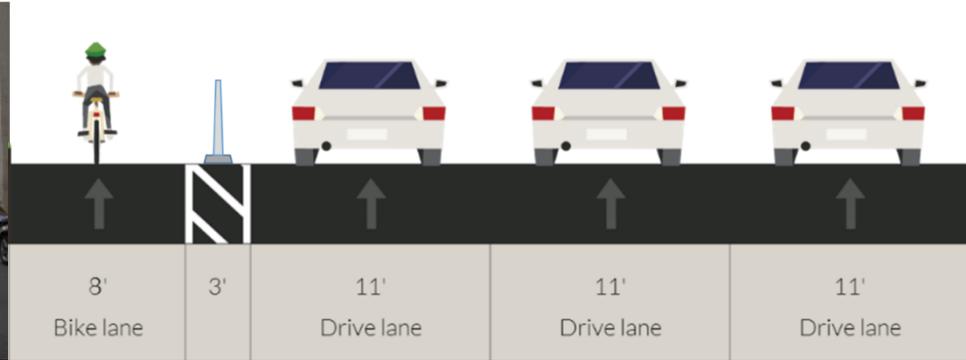
Methodology

Video Data

- Primarily intersections
- 3 locations per facility, 2 cameras per location
- 2 days of video (7am to 7pm) per location
- 168 hours analyzed
- 16,393 bicyclists and 19,724 turning vehicles observed

Example Video Screenshots (2 views) from San Francisco at Oak and Broderick

Resident Survey Details

Resident Survey

Travel Habits/ Opinions

Facility-Specific

- Driving
- Biking
- Walking
- Business

Demographics
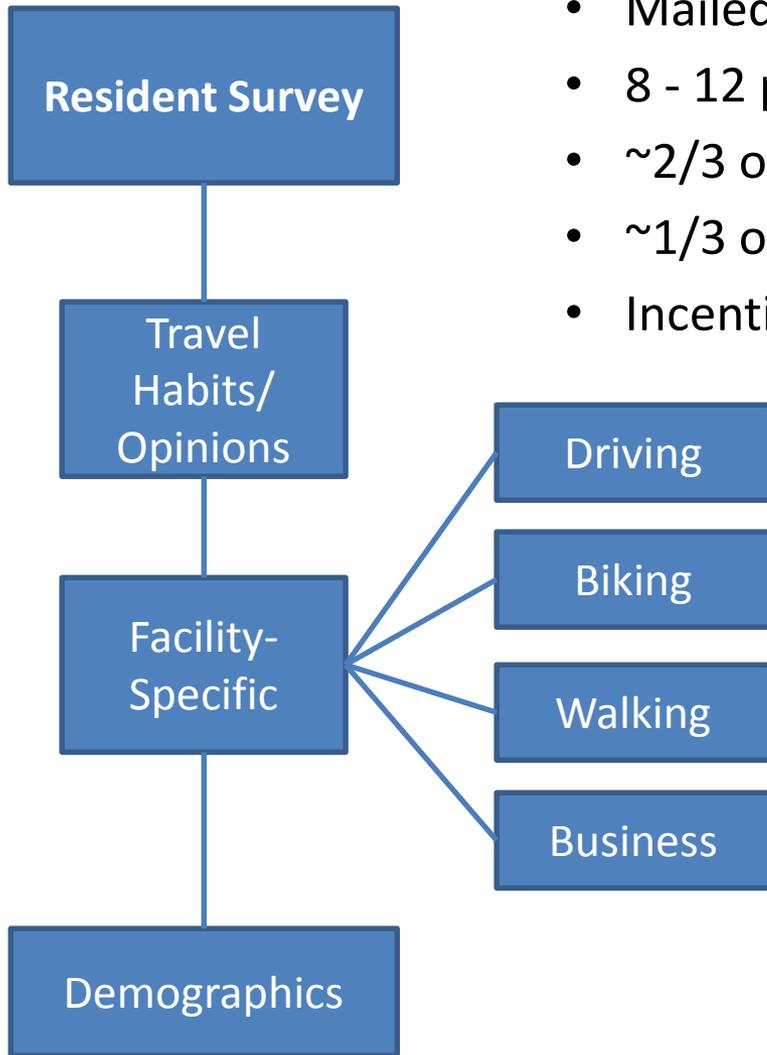
- Mailed to residents living near new protected BL
- 8 - 12 pages (~40 questions)
- ~2/3 of completions paper survey returned by mail
- ~1/3 of completions opted for online survey
- Incentive of $100 Amazon gift card raffle (3 per city)

(1) Complete this _paper survey_ and the enclosed raffle slip. Return in the postage-paid envelope;

OR

(2) Complete the _online survey_ and raffle entry at: **http://bit.ly/dc-streets**
To take the online survey, you will need to enter this code: **D00013**

Please complete the survey by 06/06/2013

Neighborhood Street Study

(1) Complete this _paper survey_ and the enclosed raffle slip. Return in the postage-paid envelope;

OR
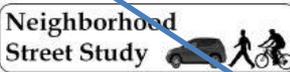
(2) Complete the _online survey_ and raffle entry at: **http://bit.ly/dc-streets**
To take the online survey, you will need to enter this code: D00013

Please complete the survey by 06/06/2013

About How You Get Around

1. For each mode of transportation, please indicate your level of use:	Commute Trips (to/from work or school)			Other Trips (e.g. to the store, park, etc.)		
	Most Trips	Some Trips	No Trips	Most Trips	Some Trips	No Trips
Car/truck/motor vehicle (including carpool)	☐₁	☐₂	☐₃	☐₁	☐₂	☐₃
Walking	☐₁	☐₂	☐₃	☐₁	☐₂	☐₃
Bicycling	☐₁	☐₂	☐₃	☐₁	☐₂	☐₃
Public Transportation	☐₁	☐₂	☐₃	☐₁	☐₂	☐₃
Other (please specify):_____	☐₁	☐₂	☐₃	☐₁	☐₂	☐₃

2. Compared to two years ago, are you taking more or fewer trips by each mode of transportation?	More Trips	No Change	Fewer Trips
Car/truck/motor vehicle (including carpool)	☐₁	☐₂	☐₃
Walking	☐₁	☐₂	☐₃
Bicycling	☐₁	☐₂	☐₃

Bicyclist Survey Details

- Bicyclists intercepted on facility and directed to online survey
- Incentive of $100 Amazon gift card raffle (3 per city)

Bicyclist Survey

Trip Details

Facility-Specific

Demographics

Experience with operations and safety

Bikeway encounters and collisions

Unique facility treatments and intersections

Dear Bicyclist,

As part of the national "Neighborhood Street Study", we are conducting a study of the **Oak and Fell Street separated bikeways** that run between Scott Street and Baker Street.

You can participate in the study by completing an _online bicyclist survey_. It will take about 10-20 minutes.

- You can take the survey by going to the following website: **http://tinyurl.com/OakFellBikeLanes**
- To take the survey, you will need to enter this code: **F0008**

We are only asking a sample of bicyclists to complete this survey. Therefore, your participation is very important. In appreciation, everyone who completes the survey by **09/09/13** can enter a random drawing for one of **three $100 gift cards to Amazon**!

Your participation in the survey is voluntary. We will protect the confidentiality of your individual survey responses. The number above indicates to us where and when you received the postcard and helps prevent duplicate responses but cannot be used to identify you. If you have concerns or problems about your participation in this study or your rights as a research subject, please contact the Human Subjects Research Review Committee, Office of Research and Strategic Partnerships, Market Center Building Suite 620, Portland State University, 503-725-4288 / 877-480-4400. If you have any questions about the study, contact us at 503-725-2875 or streets@pdx.edu.

Sincerely,

Christopher M. Monsere, Ph.D., P.E., Associate Professor & Associate Chair
Civil and Environmental Engineering, Portland State University

Neighborhood Street Study

Please log in.

Please enter the code from the postcard that you received here:

Survey Response Rates

City	Route	Resident Survey			Bicyclist Survey		
		Delivered	Returned	Response Rate	Distributed	Returned	Response Rate
Washington, DC	L Street	1,832	236	13%	763	300	39%
Austin, TX	Bluebonnet Lane	1,590	439	28%	-	-	-
	Barton Springs Road*	333	91	27%	73	18	25%
	Rio Grande Street	-	-	-	98	43	44%
San Francisco, CA	Oak /Fell	1,935	517	27%	900	278	31%
Chicago, IL	N/S Dearborn Street	1,119	197	18%	600	124	21%
	N Milwaukee Avenue	1,470	311	21%	775	236	30%
Portland, OR	NE Multnomah Street	1,467	492	34%	200	112	56%
	TOTAL	9,746	2,283	23%	3,409	1,111	33%

*Note Barton Springs Road is also surveyed in the Bluebonnet Lane resident survey

Resident

Bicyclist

Category	Resident	Bicyclist
Four year degree +	83%	89%
Income >$100k	41%	48%
Work From Home	15%	7%
Work Outside Home	66%	93%
Asian	6%	7%
Hispanic or Latino/a	5%	5%
Black	5%	1%
White	81%	89%
55 + years	34%	6%
35 to 54 years	40%	37%
<35 years of age	26%	56%
Female	53%	32%
Own working bicycle	67%	
Own/Lease a car	81%	73%
Car Share Membership	18%	28%
Transit Pass	50%	72%
Driver's License	96%	97%
Children in HH	15%	25%
2+ Adults in HH	64%	78%
Home Owners	55%	

Source: Resident and Bicyclist surveys, Green Lane evaluation

Residents by Primary Commute Mode

Mode	Residents
Non-commuter	237
Mix	335
Transit	301
Bicycle	157
Foot	313
Car / Truck	920

Source: Resident surveys, Green Lane evaluation
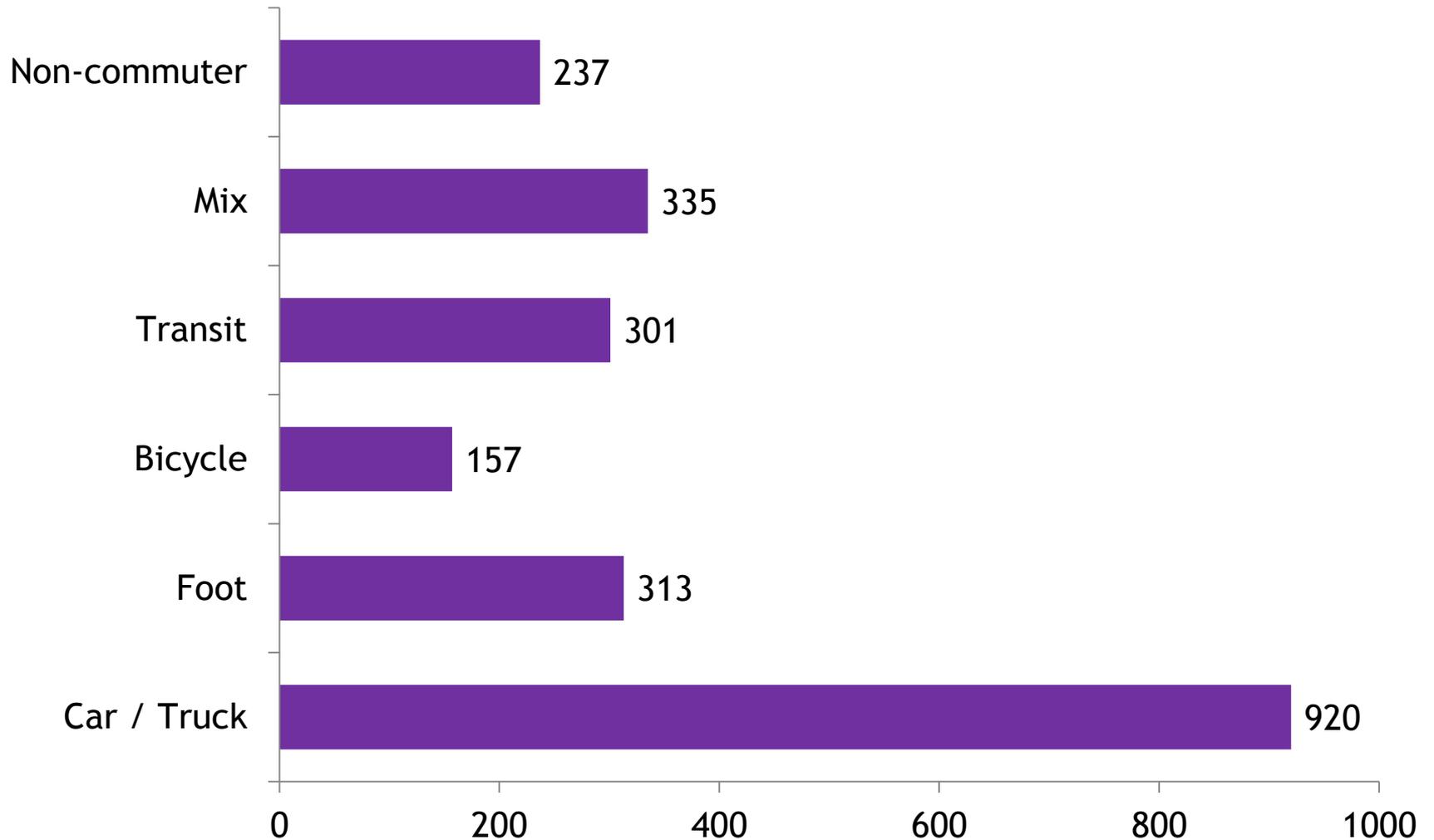
Data Methods by Facility

		Video Data	Bicyclist Survey	Resident Survey	Count Data
Austin	Barton Springs Road		●	●	●
	Bluebonnet Lane			●	●
	Rio Grande Street		●		●
Chicago	Dearborn Street	●	●	●	●
	Milwaukee Avenue	●	●	●	●
Portland	NE Multnomah Street	●	●	●	●
San Francisco	Fell Street	●	●	●	●
	Oak Street	●	●	●	
Washington DC	L Street	●	●	●	●

Data Used in Analysis

Research Element	Video Data	Bicyclist Survey	Resident Survey	Count Data
Change in Ridership	●	●	●	●
Design/Safety Evaluation	●	●	●	
Barrier Types & Comfort		●	●	
Community Support			●	

Change in Ridership:
Safety perceptions and potential riders

Change in Observed Bicycle Volumes

Legend: Before: One-way travel / After: Two-way travel (orange bars)

Percent Increase (y-axis)

- Rio Grande: 126%
- Multnomah: 68%
- Bluebonnet: 46%
- Fell: 46%
- Milwaukee: 21%
- Dearborn: 171%
- L Street: 65%
- Barton Springs: 58%

Bike lanes prior — No bike lanes prior

Source: City-provided before and after counts, PSU video counts, ACS Survey
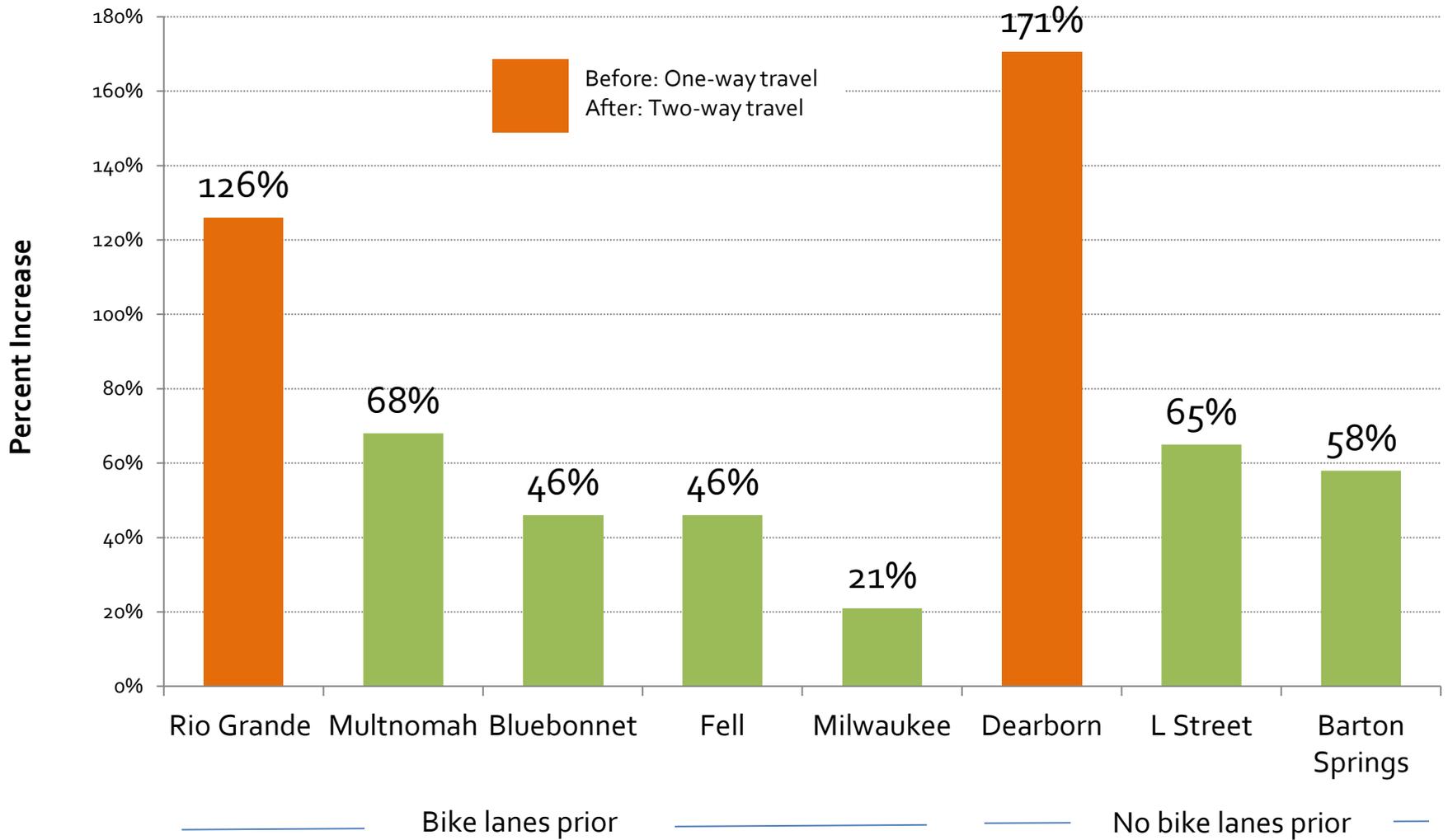
Before the new facility was built, how would you have made this trip?

Legend:
- **By bicycle, using this same route** (purple)
- **Would not have taken trip** (green)
- **By other mode** (red)
- **By bicycle, using another route** (blue)

Location	By bicycle, using another route	By other mode	By bicycle, using this same route
Dearborn	60%	21%	17%
Rio Grande	38%	7%	55%
Multnomah	34%	10%	56%
L Street	32%	10%	56%
Barton Springs	29%	6%	65%
Oak Street	18%	6%	75%
Fell Street	11%	7%	80%
Milwaukee	6%	10%	83%

One likely reason: Improved perception of safety

I feel the safety of bicycling on _____ has . .

Increased Somewhat   **Increased a Lot**
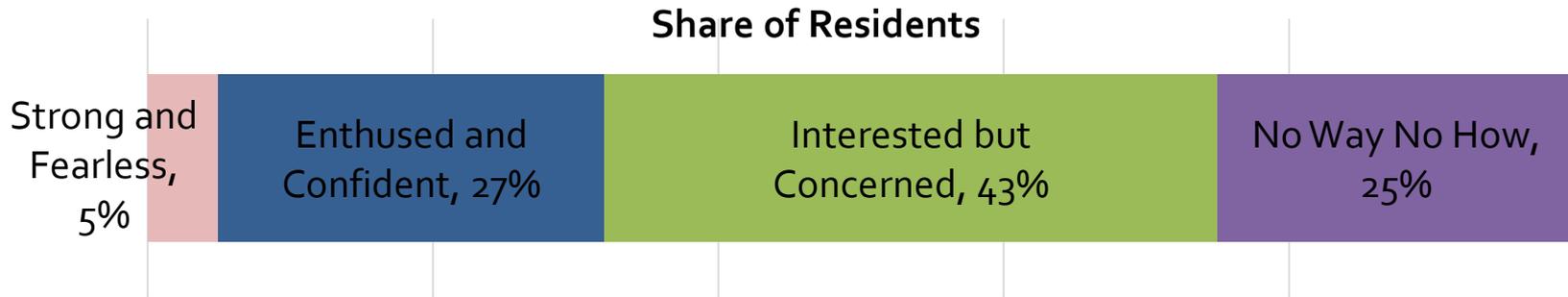
Location	Increased Somewhat	Increased a Lot
Austin Rio Grande	27%	66%
SF Oak / Fell	18%	81%
Portland Multnomah	33%	59%
Chicago Milwuakie	31%	65%
DC L Street	29%	66%
Chicago Dearborn	18%	82%
Austin Barton Springs	33%	56%

Source: Cyclist intercept surveys, Green Lane evaluation
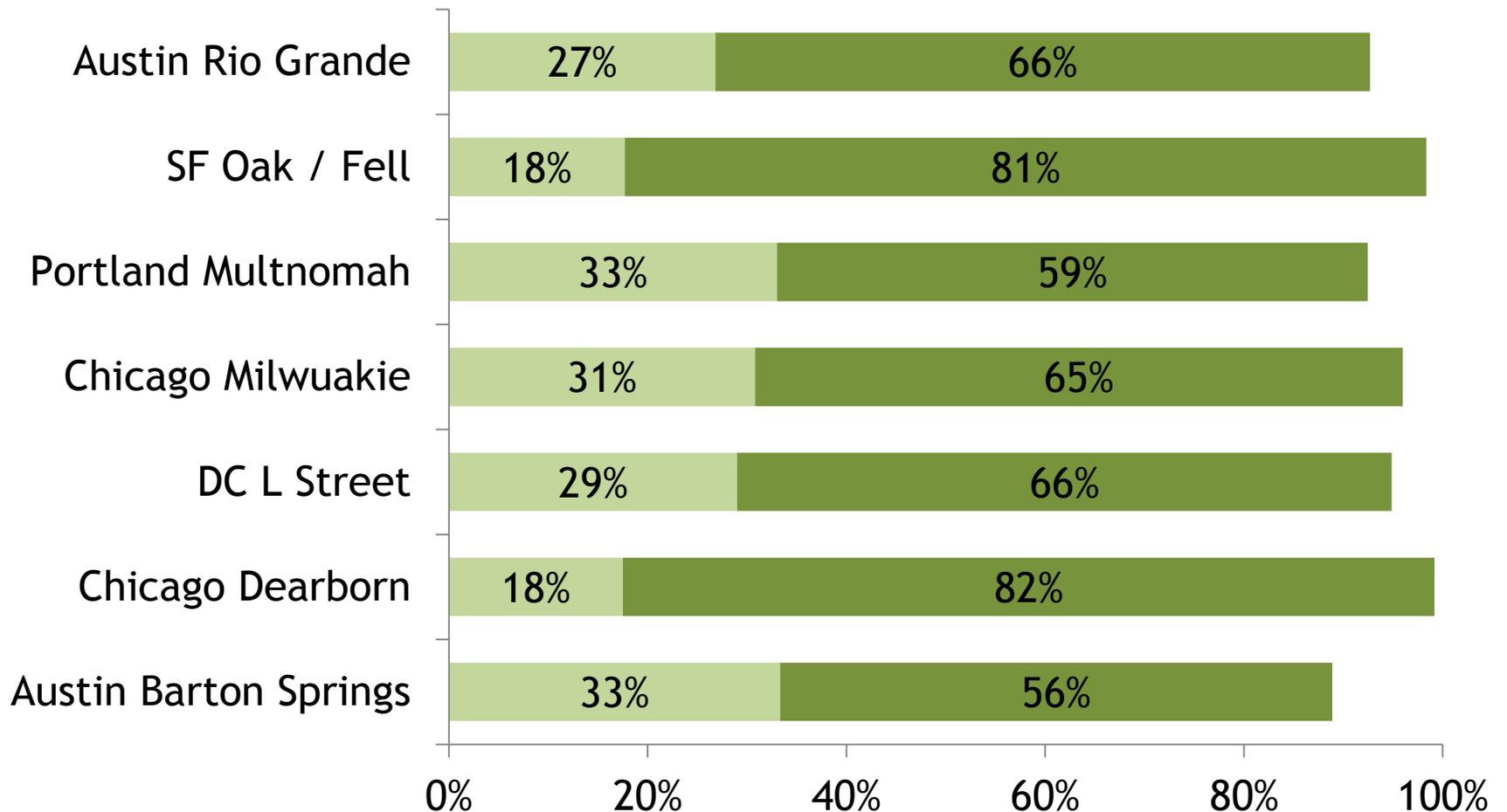
What about attracting new cyclists or increasing cycling?

Because of the _____ Street separated bikeway, how often I ride a bicycle **overall** has . . .
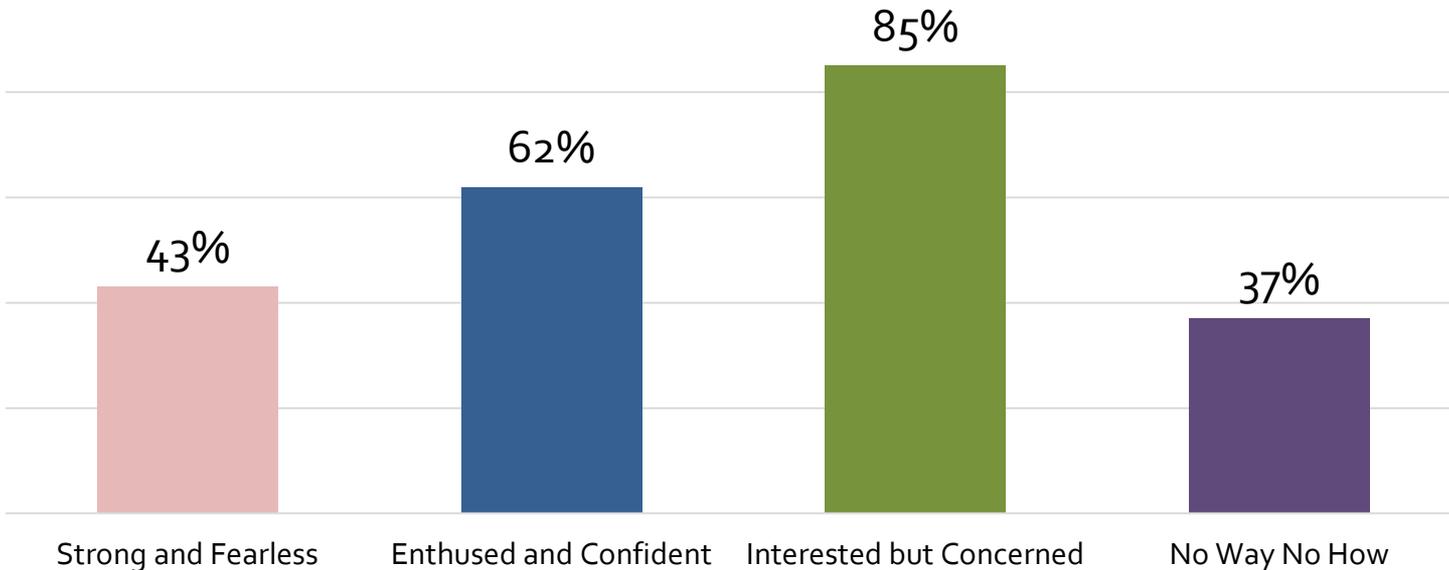

Legend: Increased Somewhat, Increased a lot

Chart categories: Men / Women for San Francisco, Washington DC, Chicago, Austin, Portland, Overall
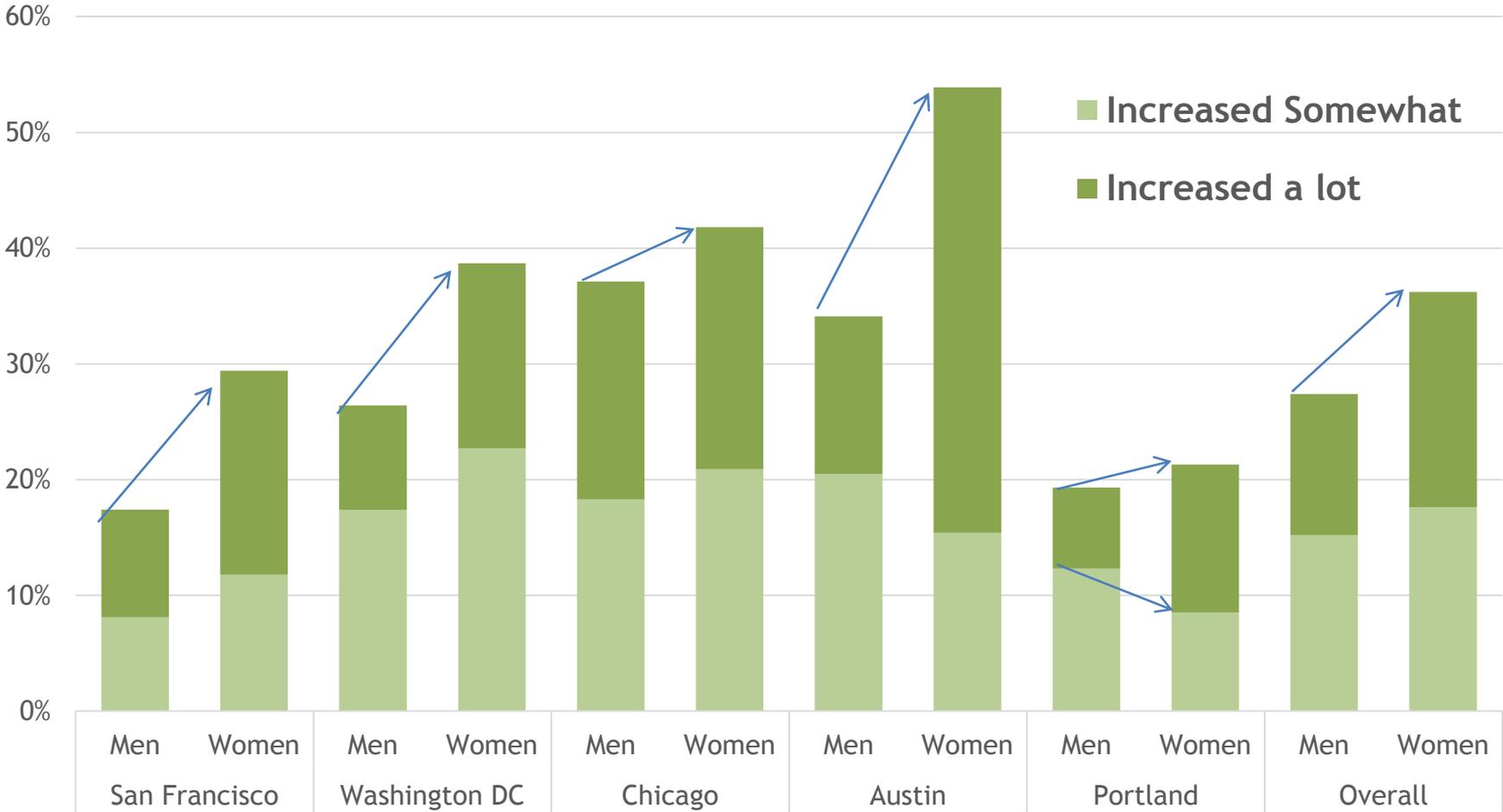
Source: Cyclist intercept surveys, Green Lane evaluation

Potential New Cyclists by the "Four Types"

Share of Residents

| Strong and Fearless, 5% | Enthused and Confident, 27% | Interested but Concerned, 43% | No Way No How, 25% |

I would be more likely to ride a bicycle if motor vehicles and bicycles were physically separated by a barrier.

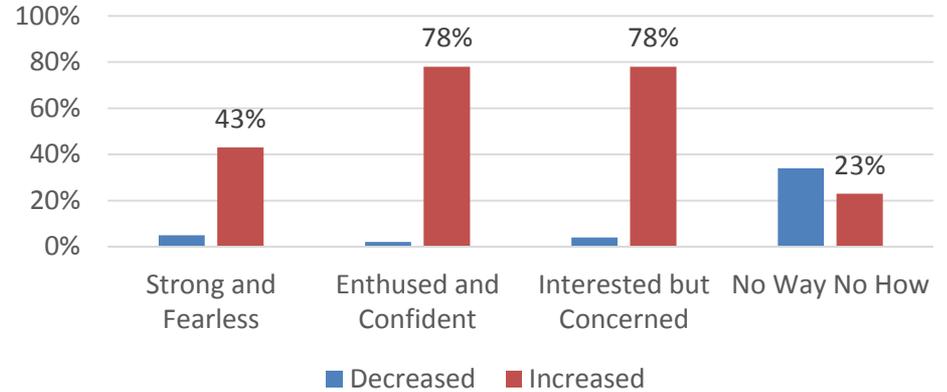- Strong and Fearless: 43%
- Enthused and Confident: 62%
- Interested but Concerned: 85%
- No Way No How: 37%

Because of the protected bike lanes, the safety of bicycling on the street has increased

Chart: Percent of Residents Stating "safety increased"

- No Way No How: 59%
- Interested But Concerned: 88%
- Enthused and Confident: 87%
- Strong and Fearless: 76%

Percent of Residents Stating "safety increased"

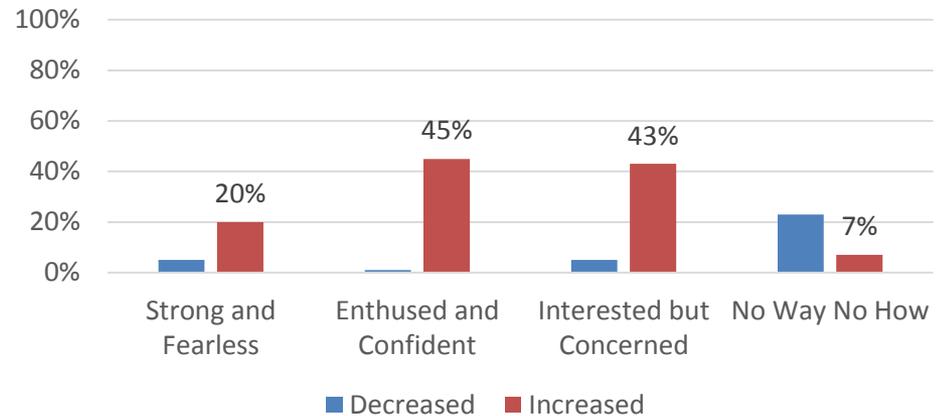Source: Resident Surveys, Green Lane evaluation
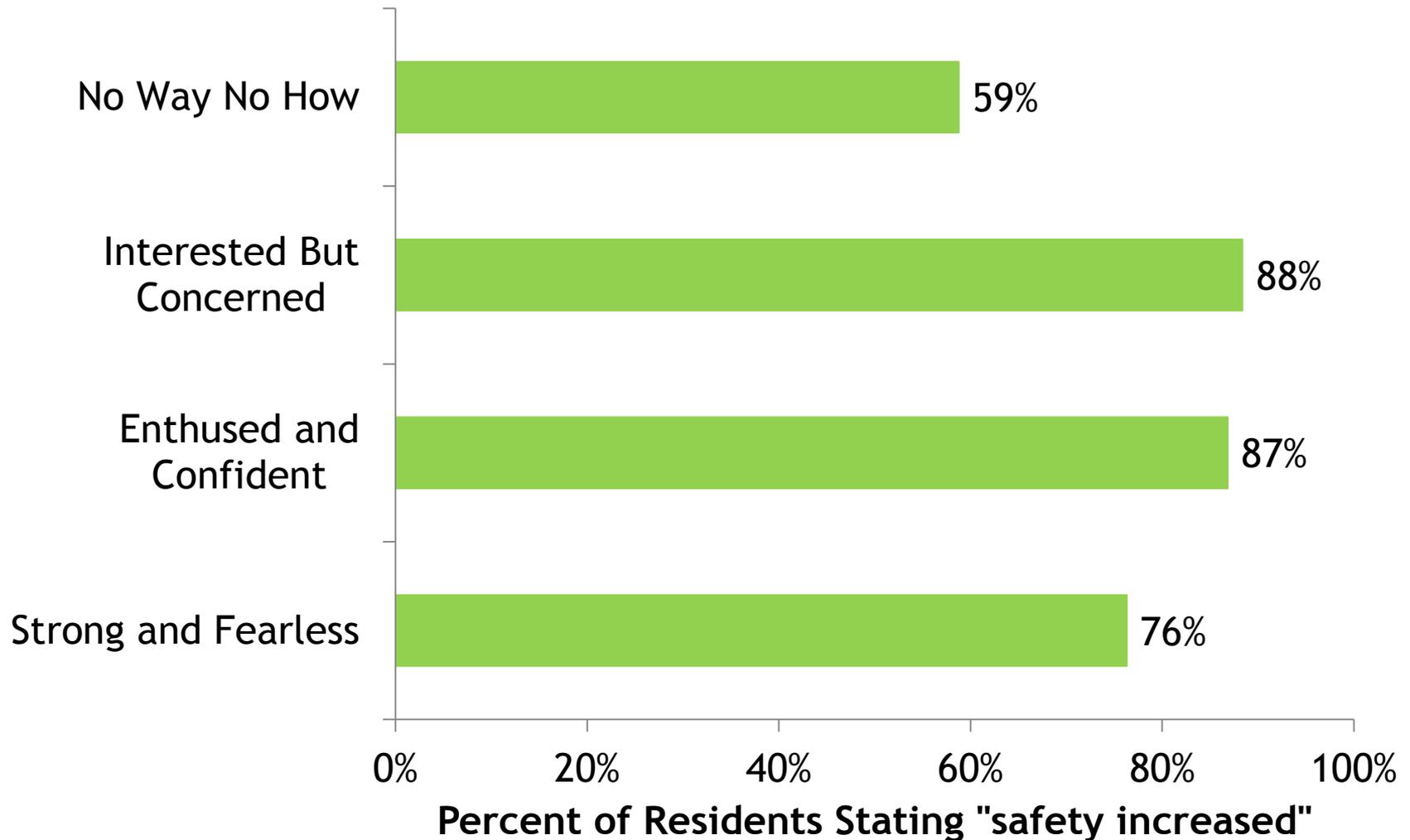
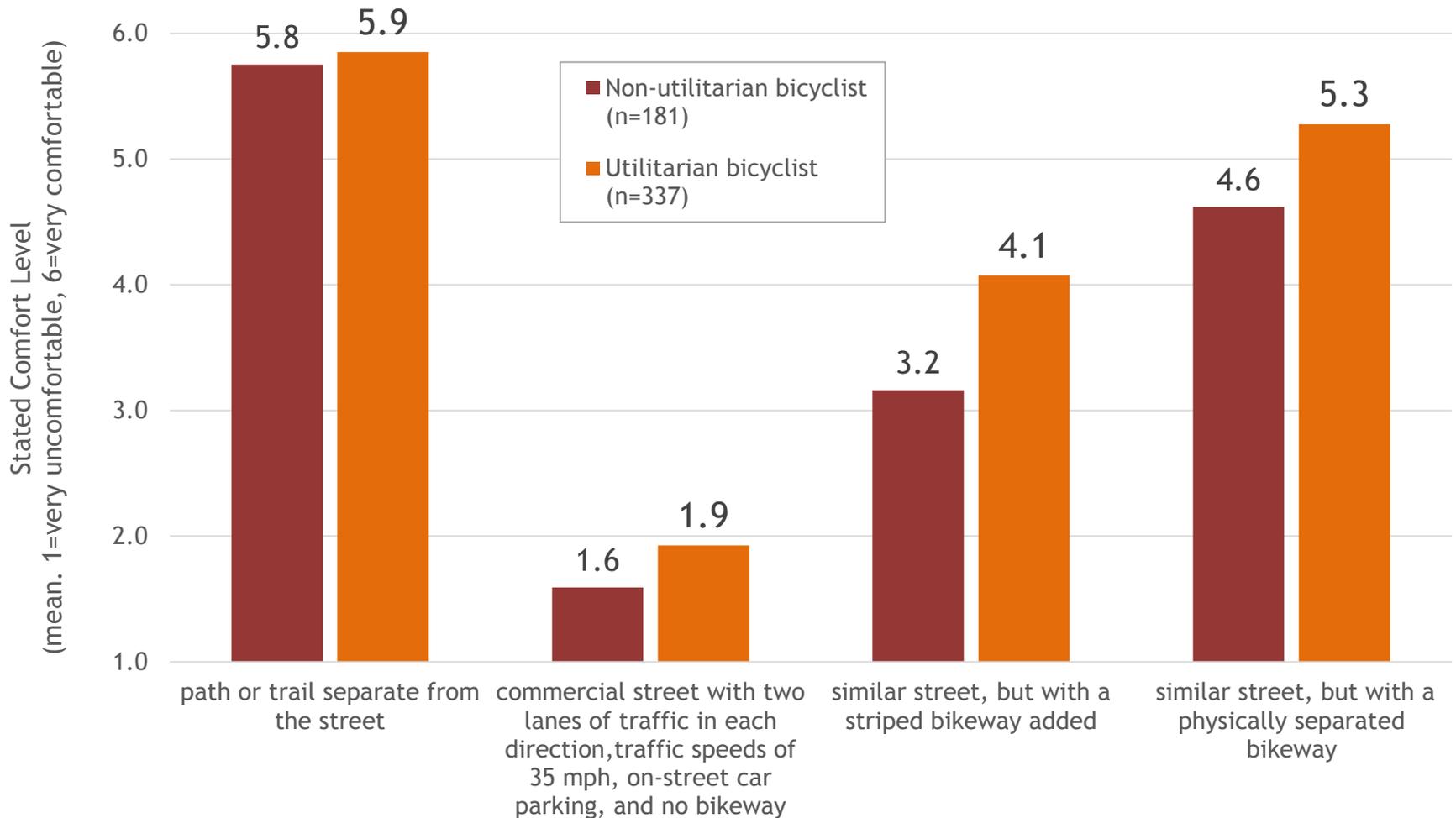# Potential New Cycling

Among residents who have ridden a bicycle on the new facility:

Because of the [facility], the likelihood that I will choose to bicycle on this street as opposed to other streets has . . .

	Strong and Fearless	Enthused and Confident	Interested but Concerned	No Way No How
Increased	43%	78%	78%	23%

Decreased ■ Increased ■

Because of the [facility], how often I ride a bicycle overall has . . .

	Strong and Fearless	Enthused and Confident	Interested but Concerned	No Way No How
Increased	20%	45%	43%	7%

Decreased ■ Increased ■

Women Residents Who Want to Bike More

Levels of comfort in different bicycling environments:
Women residents who are interested in bicycling more, by current bicycling behavior
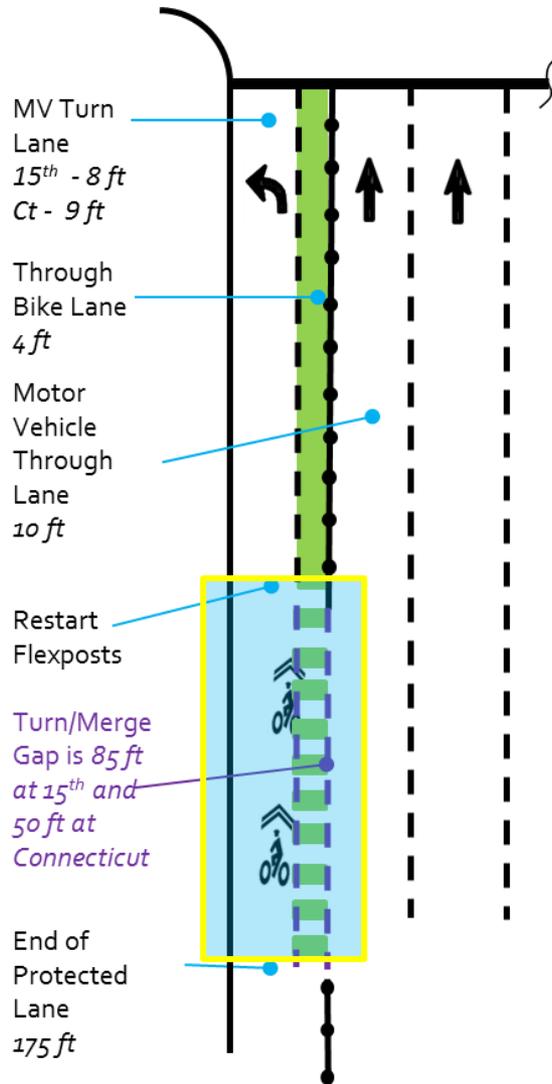
Questions?

Design:
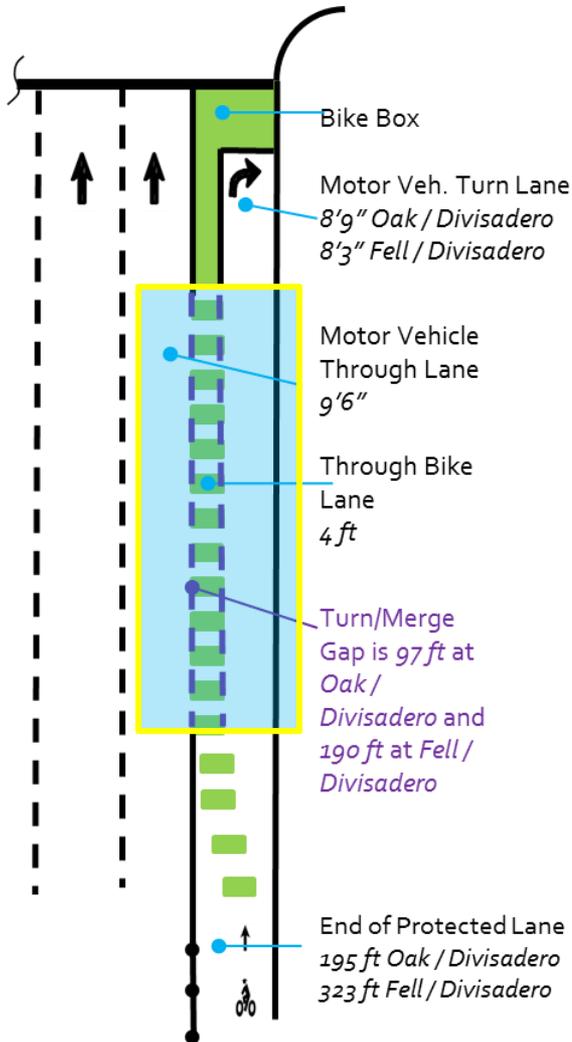Intersections, Signals, Loading Zone, Green pavement

Design Elements

- Intersections
  - Turning and mixing zones
  - Fully signalized
- Providing curb access
  - Hotel loading zone
- Other design elements
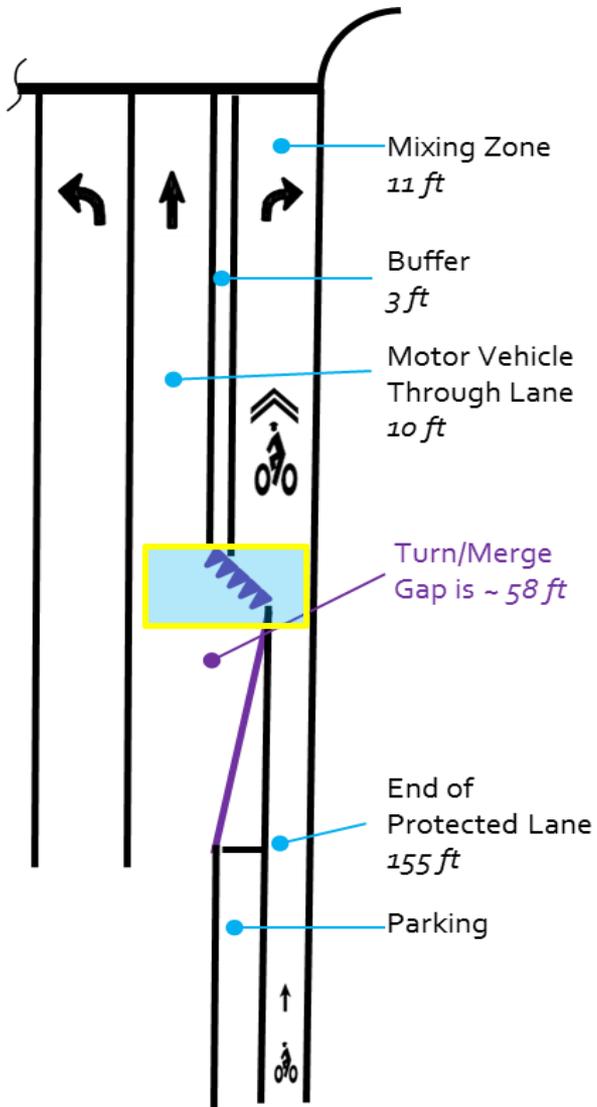 - Green pavement marking
  - Minor driveways
  - "Look Bikes"

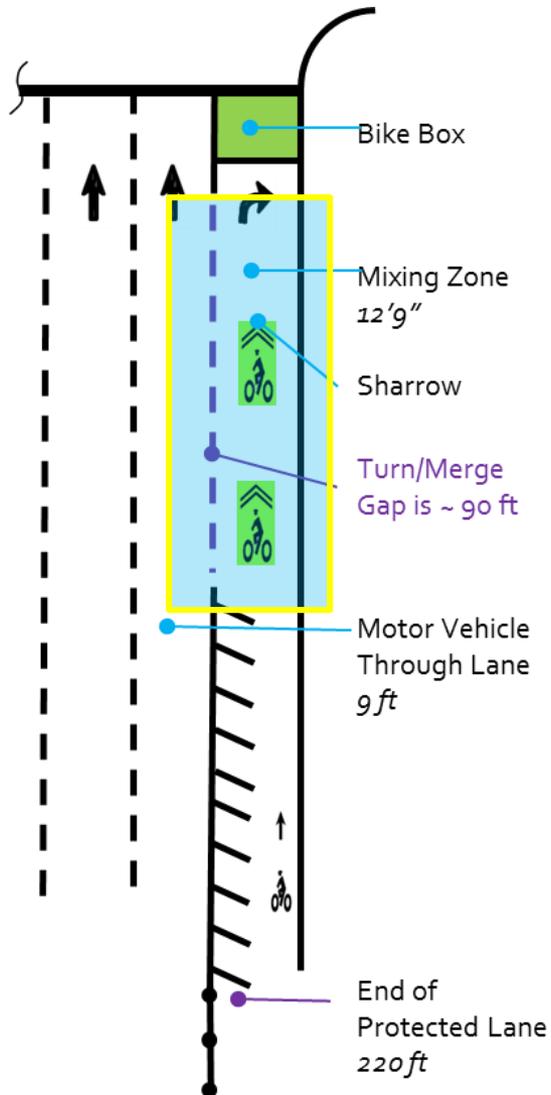# Turning Zone with Post Restricted Entry and Through Bike Lane (TBL)

MV Turn Lane
15th - 8 ft
Ct - 9 ft

Through Bike Lane
4 ft

Motor Vehicle Through Lane
10 ft

Restart Flexposts

Turn/Merge Gap is 85 ft at 15th and 50 ft at Connecticut

End of Protected Lane
175 ft

Turning Zone with Unrestricted Entry and TBL

Bike Box

Motor Veh. Turn Lane
8'9" Oak / Divisadero
8'3" Fell / Divisadero

Motor Vehicle Through Lane
9'6"

Through Bike Lane
4 ft

Turn/Merge Gap is *97 ft* at *Oak / Divisadero* and *190 ft* at *Fell / Divisadero*

End of Protected Lane
195 ft Oak / Divisadero
323 ft Fell / Divisadero

Mixing Zone with Yield Entry Markings

Mixing Zone
11 ft

Buffer
3 ft

Motor Vehicle
Through Lane
10 ft

Turn/Merge
Gap is ~ *58 ft*

End of
Protected Lane
155 ft

Parking

Mixing Zone with Sharrow Marking

Bike Box

Mixing Zone
12'9"

Sharrow

Turn/Merge
Gap is ~ 90 ft

Motor Vehicle
Through Lane
9 ft

End of
Protected Lane
220 ft

Mixing Zone with Green Skip Coloring

Mixing Zone
12'3"

Turn/Merge
Gap is ~ 100 ft

Motor Vehicle
Through Lane
9'6"

End of
Protected Lane
160 ft
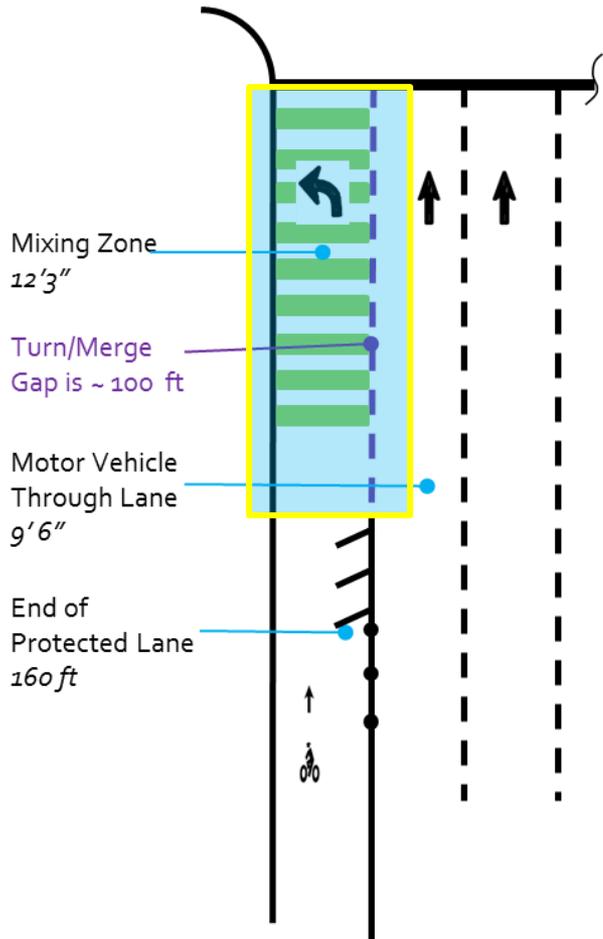
| Intersection and Type of Design	Direction of Turning Traffic	Through Bikes Per Hour	Turning Vehicles Per Hour	Observed Correct Turning Motorist	Observed Correct Through Bicycle	% of Bicyclists Agreeing They Feel Safe
Turning Zone with Post Restricted Entry and Through Bike Lane (TBL) L Street / 15th	Left	110	173	86%	93%	64%
Turning Zone with Post Restricted Entry and TBL L Street / Connecticut	Left	116	125	88%	89%	64%
Turning Zone with Unrestricted Entry and TBL Oak / Divisadero	Right	201	126	66%	81%	74%
Mixing Zone with Yield Entry Markings NE Multnomah / 9th	Right	31	94	93%	63%	73%
Mixing Zone with Sharrow Marking Oak / Broderick	Right	188	24	48%	30%	79%
Mixing Zone with Green Skip Coloring Fell / Baker	Left	226	48	49%	-	84%

DC Design on M Street

Photo from @JenniferDillPSU

Dearborn and Madison, Chicago, IL
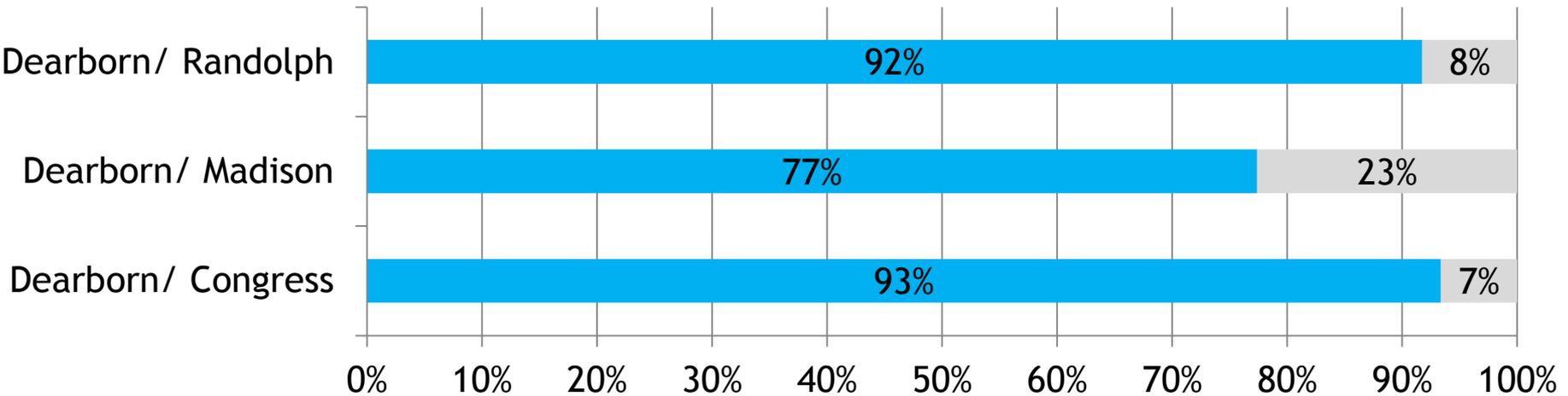Photo: C. Monsere

40

Bicycle Signals on Dearborn

- Using the small bicycle in the bicycle signal lens is a good way to communicate the signal is only for bicycles
  - 87% agree
- I like that bicyclists and turning cars each have their own signal
  - 74% agree
- At these intersections, it is always clear to me which signal I should use as a motorist
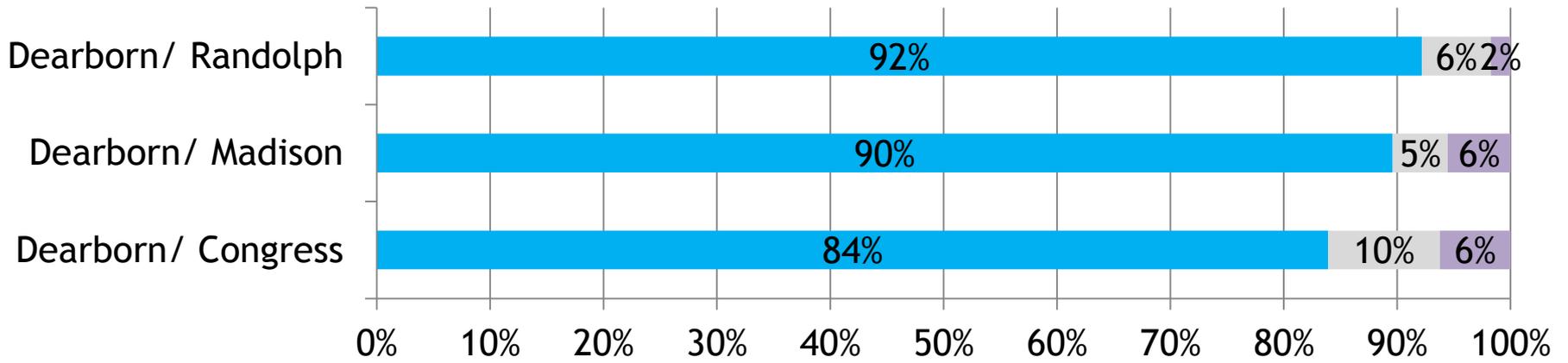 - 66% agree
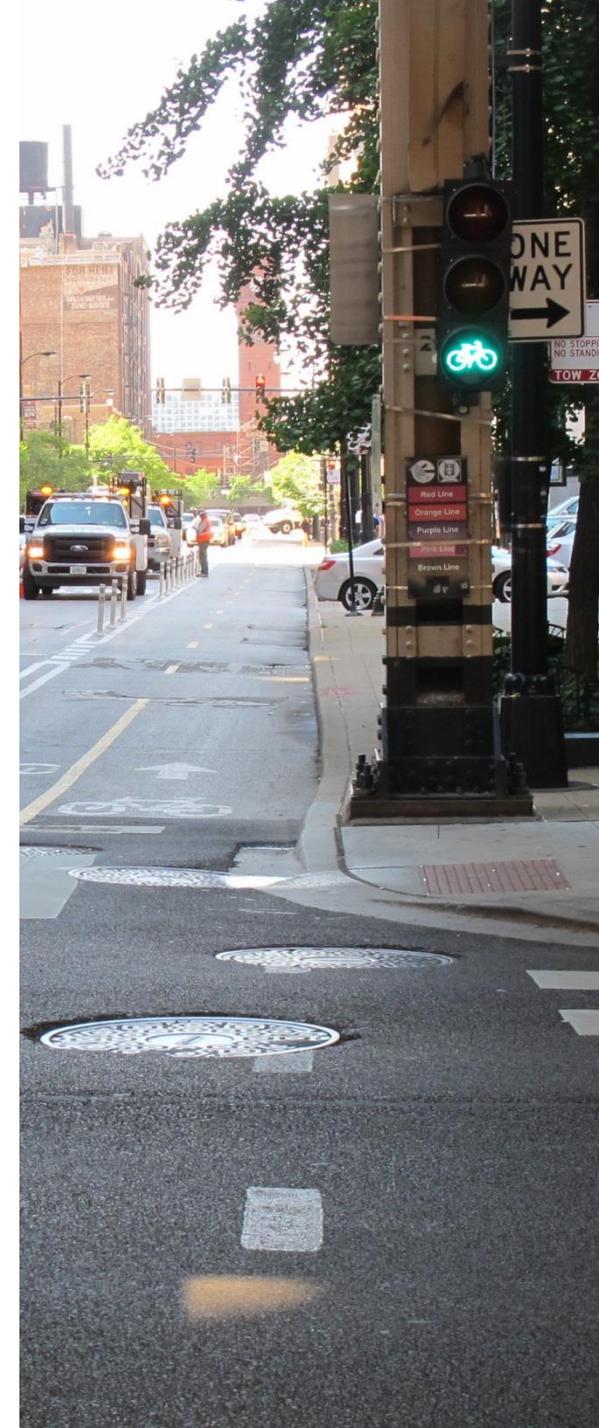
People on Bicycles

■ Waited for green/legal right-turn on red   ■ Proceeded illegally on red

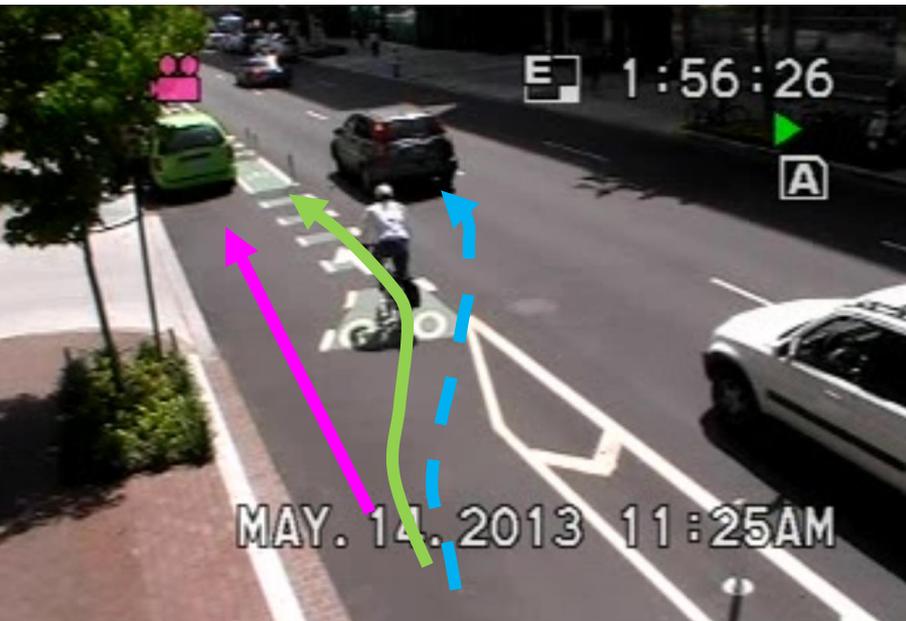|	
Dearborn/ Randolph	92% / 8%
Dearborn/ Madison	77% / 23%
Dearborn/ Congress	93% / 7%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

People in Motor Vehicles

■ Legal Turn on Green   ■ Illegal Turn on Red Arrow   ■ Jumped into crosswalk

Dearborn/ Randolph	92% / 6% 2%
Dearborn/ Madison	90% / 5% 6%
Dearborn/ Congress	84% / 10% 6%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Hotel Loading Zone

Bicycle Use

Legend: ■ Used TBL ■ Did not use TBL ■ Forced out

Cars Present, n=128	48%	12%	40%
No Cars Present, n=615	37%	63%	

0%   20%   40%   60%   80%   100%

Motor Vehicle Use

Legend: ■ In TBL ■ Keeps TBL Clear ■ In Merge Zone

Cars Present, n=44	30%	61%	7%

0%   20%   40%   60%   80%   100%
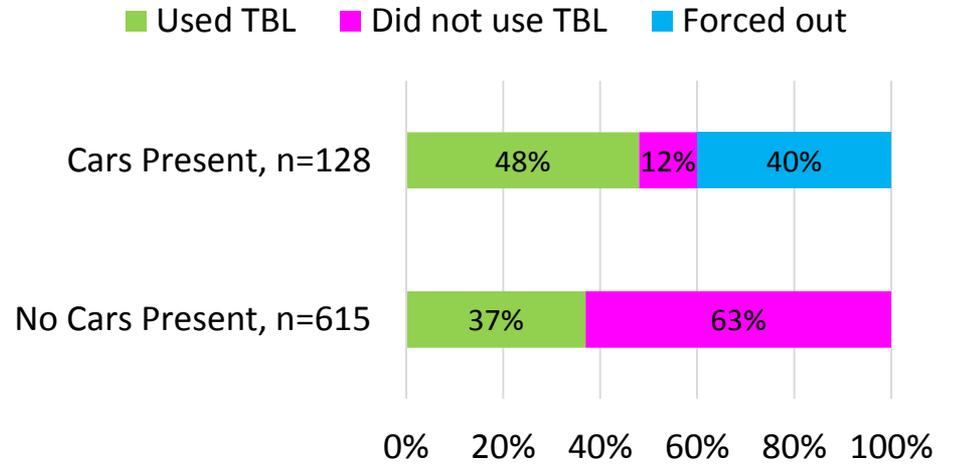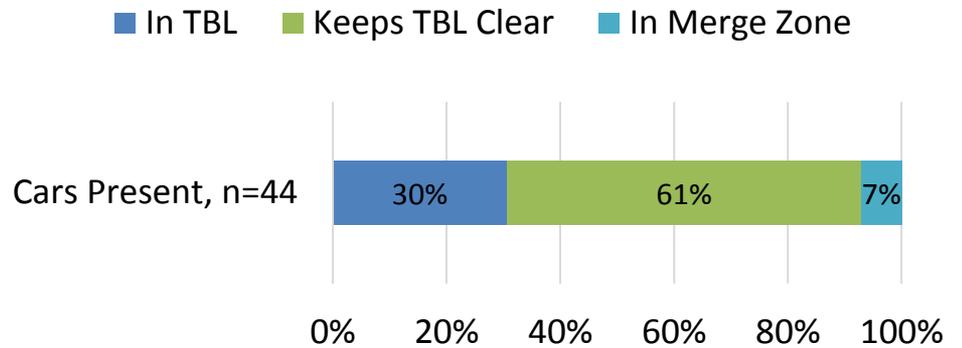
Meaning of Green Marking

Bar chart comparing responses for Portland, Multnomah; Chicago, Milw; and Chicago, Dearborn.

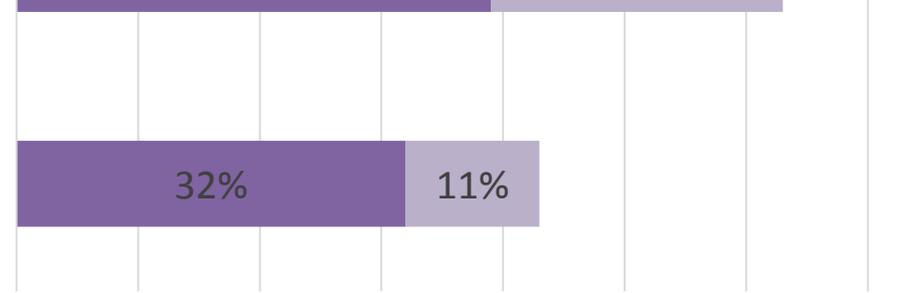| Response	Portland, Multnomah	Chicago, Milw	Chicago, Dearborn
I don't know	10%	15%	19%
Other	3%	1%	3%
Marks space for bicyclists to stop	15%	1%	3%
Marked space alerts motorists and/or bicycles of conflict area (includes bicyclists have ROW, use caution, shared area, merge area)	42%	52%	62%
Marked space is for bicycles only (a protected lane, a bicycle lane, a place that bikes should be)	30%	31%	14%

n=

Minor Intersections

■ Somewhat Agree   **■ Strongly Agree**

The "Yield to Bikes" signs have made me pay closer attention to cyclists when turning off Milwaukee Ave.

| 39% | 24% |
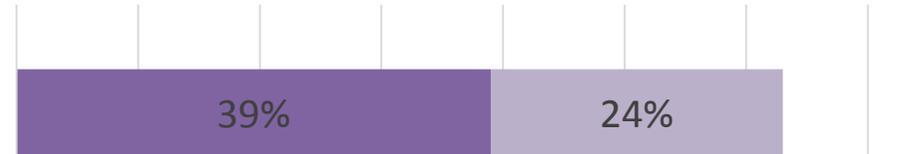
When I want to turn right, I am able to adequately see if there are any approaching cyclists in the bike lane.

| 32% | 11% |

0% 10% 20% 30% 40% 50% 60% 70%

n=276

Look Bikes

1=Not effective at all   6= Very Effective

How effective do you think these markings will be at warning pedestrians about bicycle traffic?

| 14% | 14% | 22% | 25% | 16% | 9% |

n=191

0%   20%   40%   60%   80%   100%
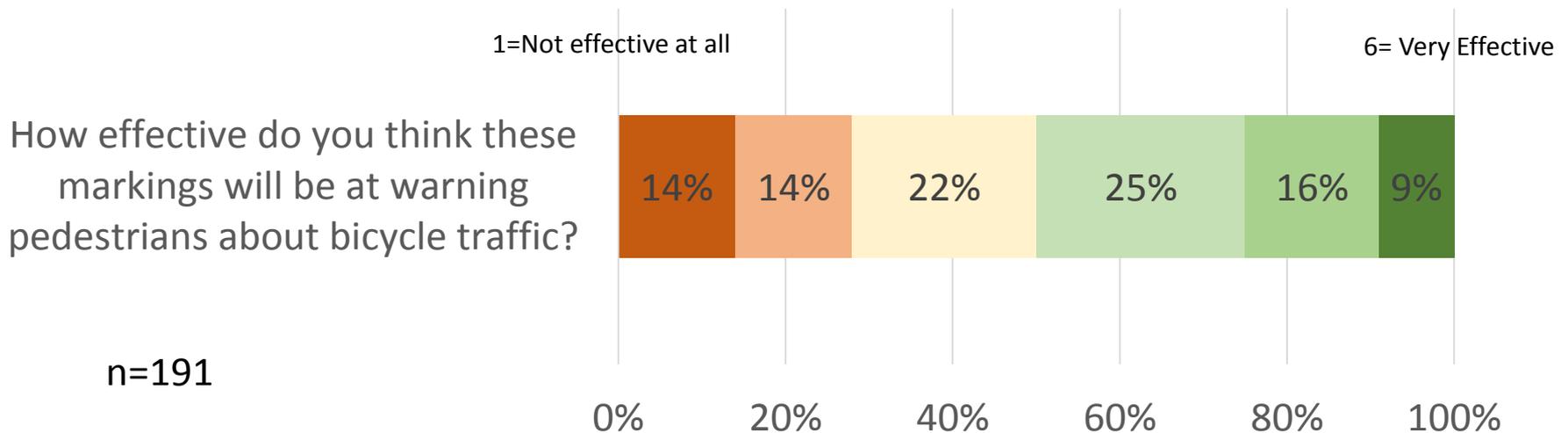
Questions?

Barriers:
Buffer types and perceived comfort

48

Buffer type affects safety and comfort

Types of buffers used include:

Flexposts and painted buffer
(Fell Street, San Francisco)

Parked vehicles and flexposts
(Milwaukee Avenue,
Chicago)

Semi-permanent planter with
colored pavement
(Multnomah St., Portland)

49

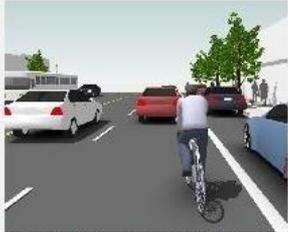# Comfort on Hypothetical Facilities with Varying Buffers

Residents + Bicyclists

Whether or not you currently ride a bicycle, please consider how comfortable you **would** be riding a bicycle in each place:

	Very Uncomfortable (1)	(2)	(3)	(4)	(5)	Very Comfortable (6)

(A) On a path or trail separate from the street

(B) On a commercial street with two lanes of traffic in each direction, with traffic speeds of 35 miles per hour, on-street car parking, and no bike lane

(C) On a similar street to (B), but with a striped bike lane added

(D) On a similar street to (B), but with a physically separated bike lane

Bicyclists Only

How comfortable would you feel bicycling on a commercial street with two lanes of traffic in each direction, with traffic speeds of 35 miles per hour (Situation D above), but with the following types of separation from traffic:

With a solid painted buffer

With a painted 2-3 foot buffer

With a painted buffer and parked cars

With a raised concrete curb

With a 2-3 foot buffer and plastic flexposts

With planters separating the bikeway

Images created Nick Falbo, Alta Planning + Design

Bicyclists: Mean Stated Comfort with <u>Hypothetical</u> <u>Buffers</u>

Legend:
- Austin Barton Springs
- Austin Rio Grande
- Chicago Dear.
- Chicago Milw.
- Portland Mult.
- SF Oak / Fell Streets
- D.C. L Street

Categories (x-axis):
- Solid painted buffer (5)
- Painted 2-3 foot buffer (3)
- Painted buffer and parked cars (1)
- Raised concrete curb (6)
- 2-3 foot buffer and plastic flexposts (2)
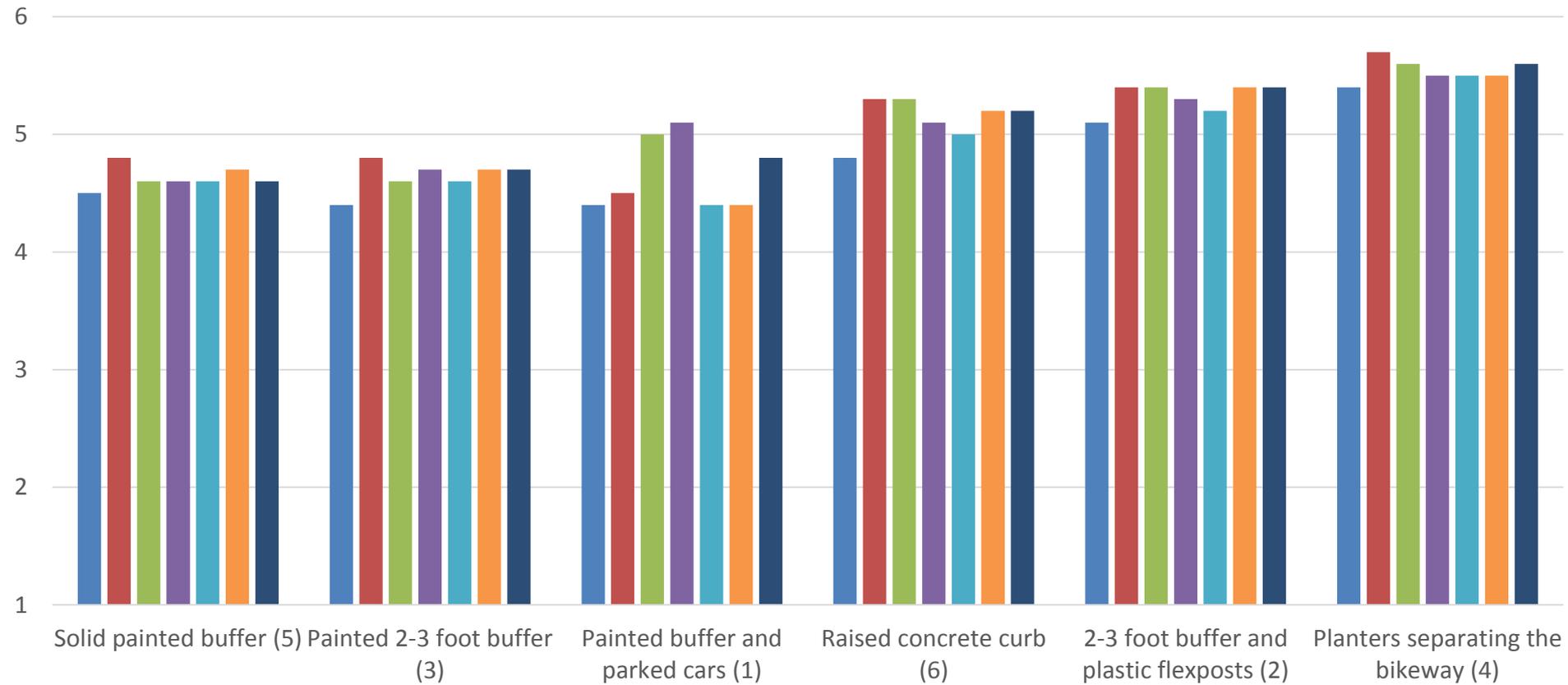- Planters separating the bikeway (4)

Change in Stated Comfort (from a bike lane), by bicyclist type

■ Strong and Fearless ◪ Enthused and Confident ■ Interested But Concerned

Percent Increase of Normalized Score (with a standard biccyle lane as base)

Category	Strong and Fearless	Enthused and Confident	Interested But Concerned
A painted 2-3 foot buffer	1%	-1%	24%
A solid painted buffer	-1%	-1%	24%
A painted buffer and parked cars	-5%	-4%	31%
A raised concrete curb	-2%	1%	50%
A 2-3 foot buffer and plastic	7%	10%	48%
Planters separating the bikeway	6%	9%	60%
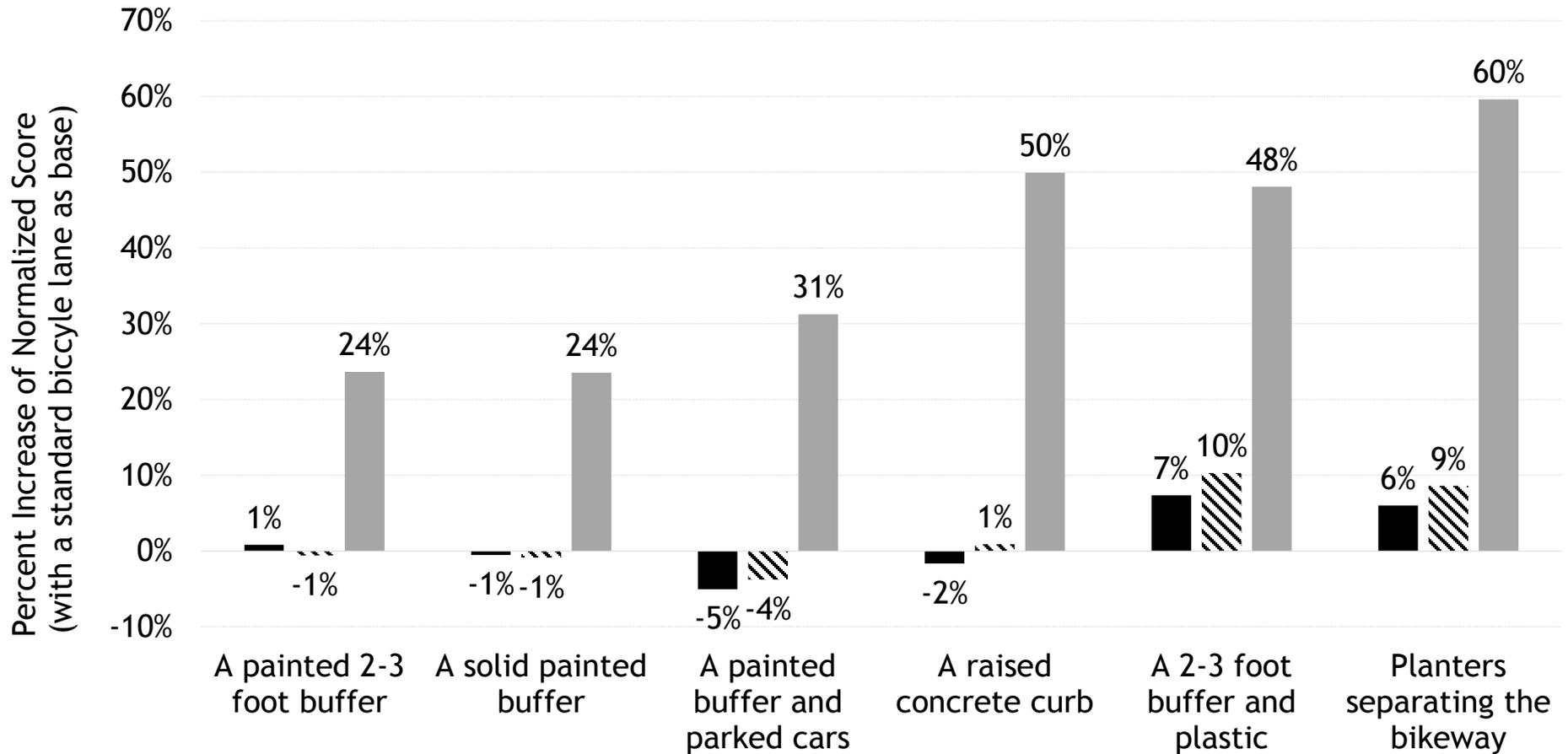
Bicyclists: Comparing Stated Comfort on Hypothetical Facilities to Stated Comfort on <u>Actual</u> Facilities
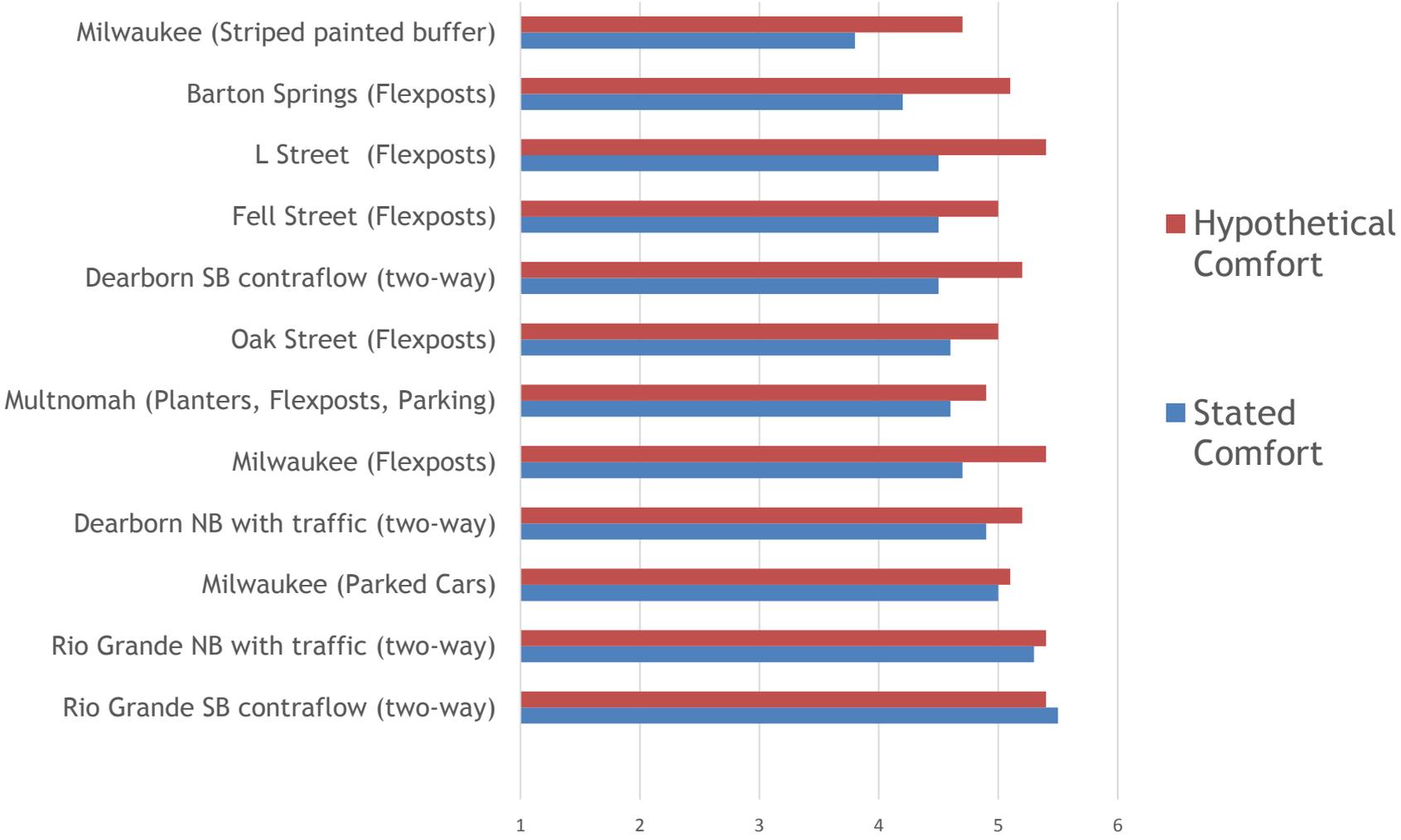
Source: Cyclist intercept surveys, Green Lane evaluation

Bicyclists: Buffer width and Sense of Safety

...buffer makes me feel safe

(shared-use path)

Mean Score vs Total Width (ft)
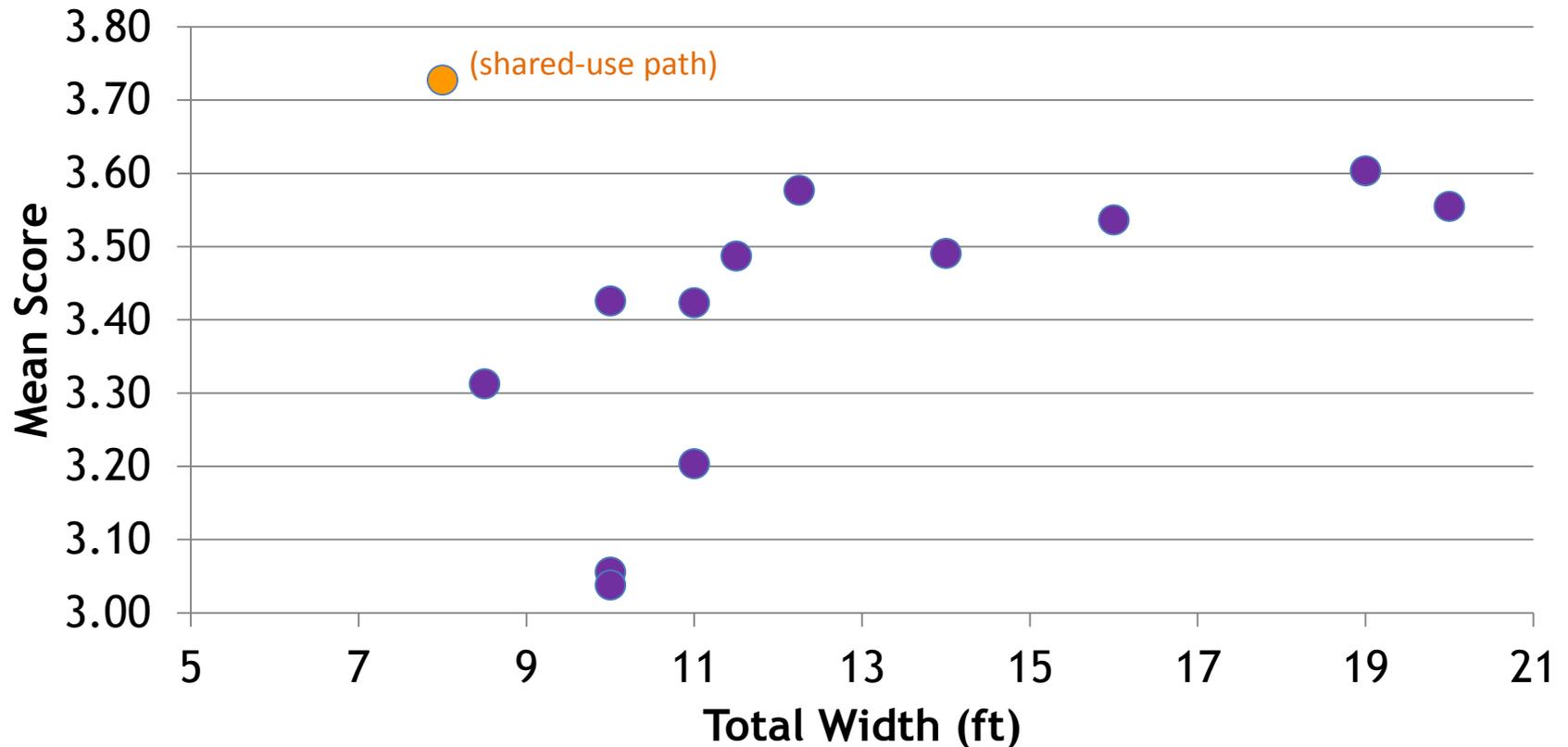
Far Edge of Bicycle Facility to Near Edge of Motor Vehicle Lane

| 5' Bike lane | 9' Buffer | 9' Drive lane | 10' Turn lane | 10' Drive lane | 7' Buffer | 7' Bike lane |

Community Support:
Motorists, Pedestrians, General

Support for Protected Lanes

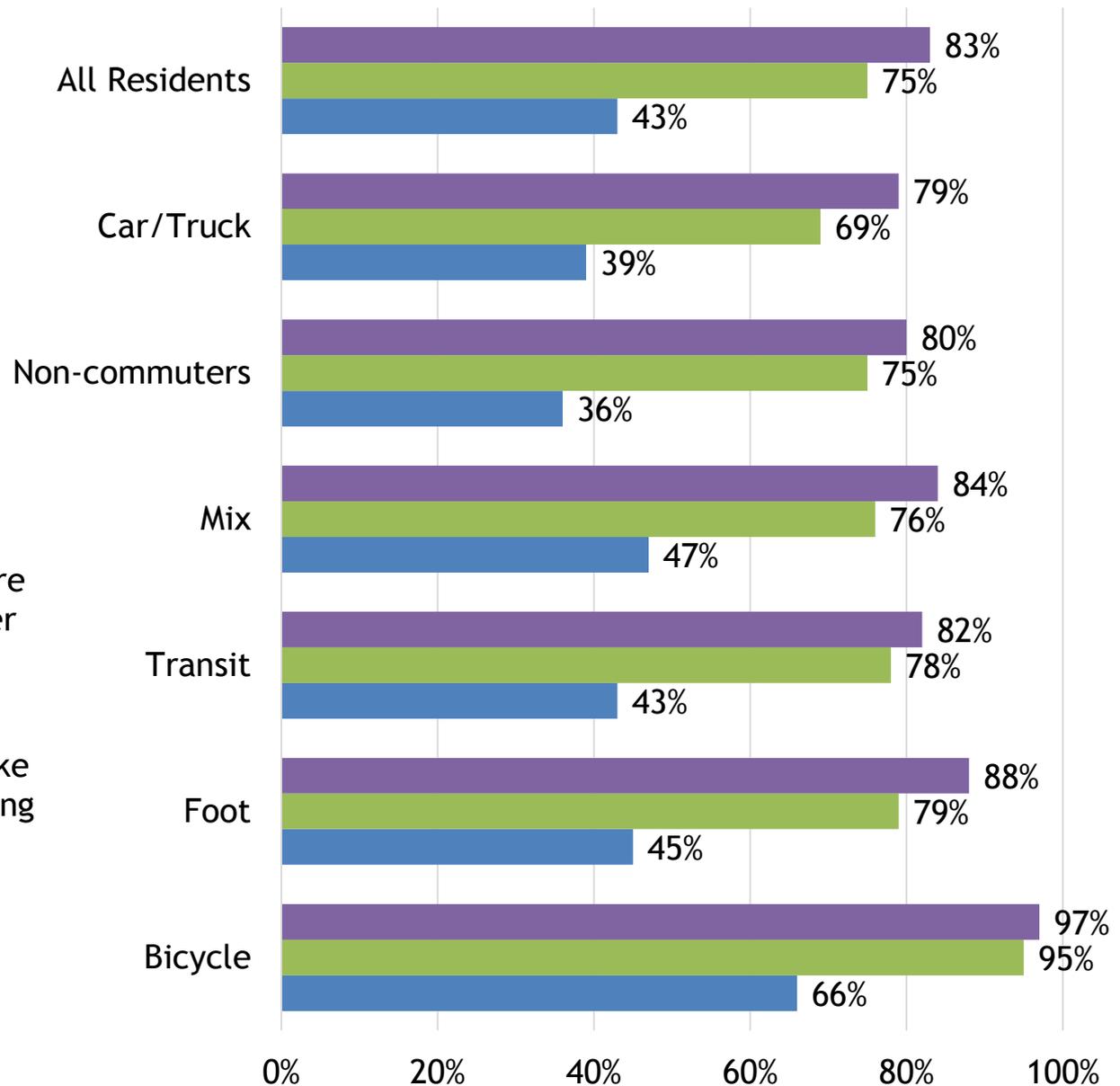■ Facilities that encourage bicycling for transportation are a good way to improve public health.

■ I would support building more protected bike lanes at other locations.

■ Because of the protected bike lanes, the desirability of living in my neighborhood has increased

All Residents
- 83%
- 75%
- 43%

Car/Truck
- 79%
- 69%
- 39%

Non-commuters
- 80%
- 75%
- 36%

Mix
- 84%
- 76%
- 47%

Transit
- 82%
- 78%
- 43%

Foot
- 88%
- 79%
- 45%

Bicycle
- 97%
- 95%
- 66%

0% 20% 40% 60% 80% 100%

Source: Resident surveys, Green Lane evaluation

Because of the protected bike lanes, the safety of _____ on the street has . .

Portland, Multnomah — Walking 37%, Driving 45%, Bicycling 74%

San Francisco, Oak — Walking 21%, Driving 38%, Bicycling 80%

Austin, Bluebonnet — Walking 52%, Driving 38%, Bicycling 85%

Austin, Barton Springs — Walking 44%, Driving 43%, Bicycling 82%

Chicago, Milwaukee — Walking 19%, Driving 28%, Bicycling 74%

Chicago, Dearborn — Walking 15%, Driving 23%, Bicycling 76%

Washington DC - L St. — Walking 27%, Driving 30%, Bicycling 80%

Percent of Residents Stating "Safety Increased"

Legend: Walking, Driving, Bicycling

Source: Resident Surveys, Green Lane evaluation

Because of the protected bike lanes,

...my satisfaction with the walking environment on this street

■ Increased ■ No Change

Street	Increased	No Change
L Street	36%	53%
Oak/Fell	33%	49%
Multnomah	37%	56%
Milwaukee	19%	56%
Dearborn	17%	54%
Bluebonnet	49%	41%
Barton Springs	58%	37%

0% 20% 40% 60% 80% 100%
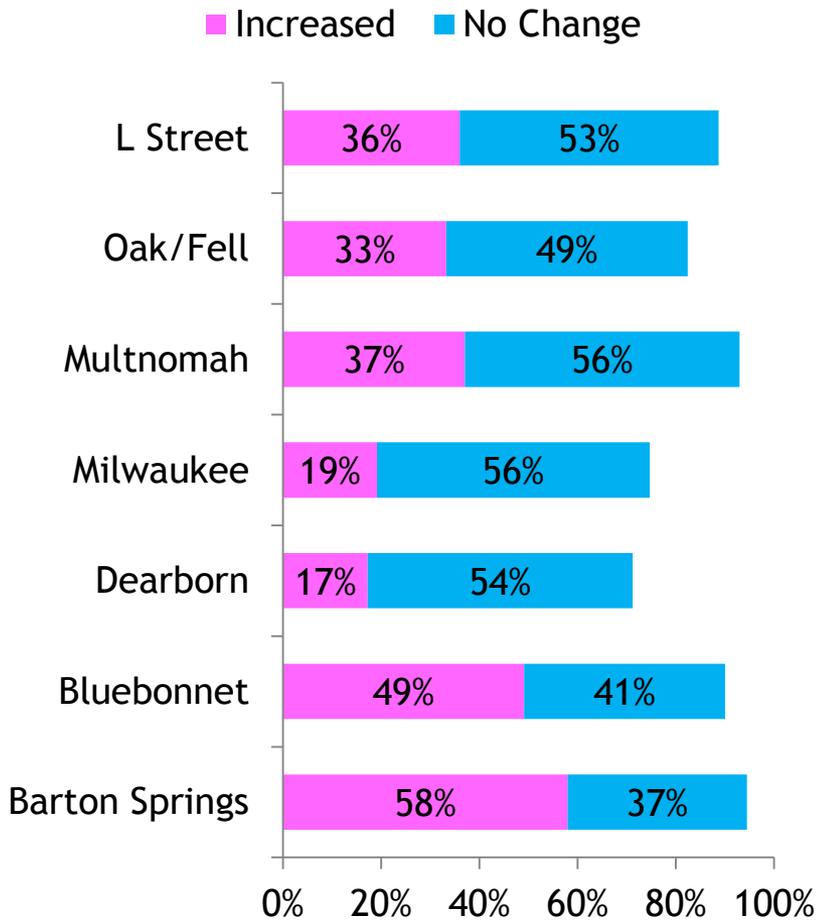
...my sense of safety when crossing this street has

■ Increased ■ No Change

Street	Increased	No Change
L Street	27%	53%
Oak/Fell	24%	55%
Multnomah	35%	57%
Milwaukee	17%	46%
Dearborn	18%	38%
Bluebonnet	34%	57%
Barton Springs	43%	51%

0% 20% 40% 60% 80% 100%

Source: Resident Surveys, 78% of respondents have walked on street, Green Lane evaluation
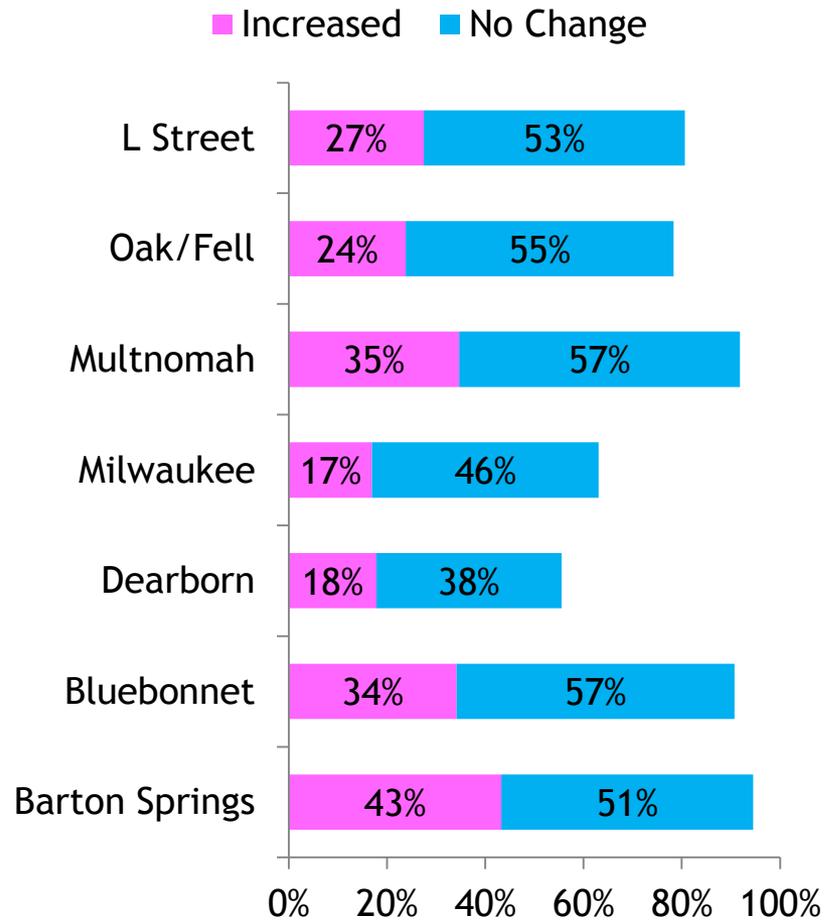
Perceptions of residents driving on street

Percent responding increased

Chart showing two series by street:
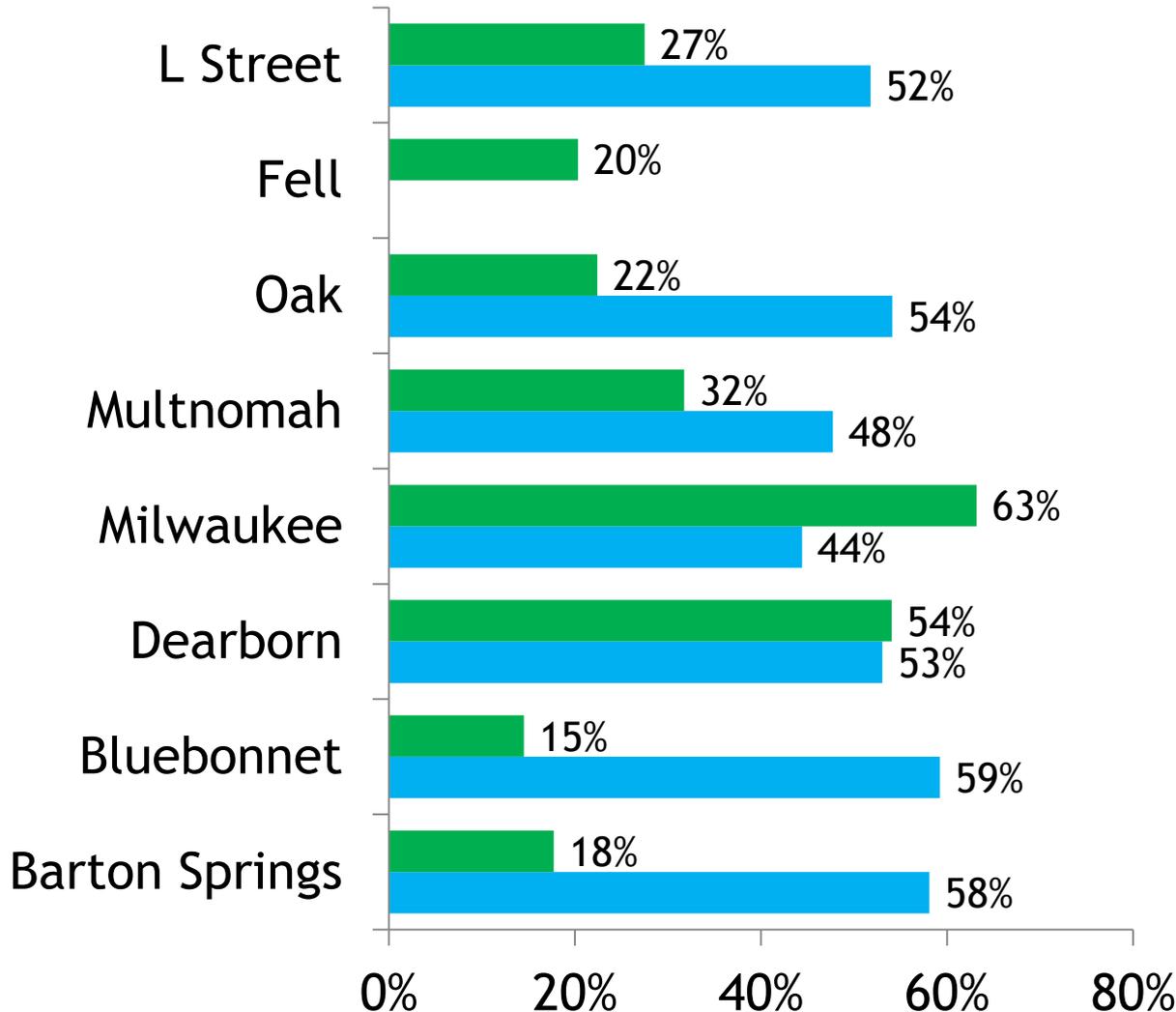
Street	Since the protected bike lanes were built, the amount of time it takes me to drive on this street has . . .	Since the protected bike lanes were built, how safe and predictable bicyclists are acting has . . .
L Street	27%	52%
Fell	20%	
Oak	22%	54%
Multnomah	32%	48%
Milwaukee	63%	44%
Dearborn	54%	53%
Bluebonnet	15%	59%
Barton Springs	18%	58%

Perceptions about Parking

% indicating negative impact on…

- ability to find a parking spot on the street
- how stressful it is to park on the street

Chart data:

Location	ability to find a parking spot on the street	how stressful it is to park on the street
Oak/Fell (-50 spots)	55%	~52%
Milwaukee (-some)	49%	~61%
L Street (-150 spots)	46%	~45%
Bluebonnet (-some)	44%	~38%
Dearborn (-minimal)	41%	~48%
Multnomah (+20 spots)	30%	~33%

Questions?
http://bit.ly/nitc_583

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BONUS / REFERENCE SLIDES

Study Routes: Pre-Conversion

	Austin			Chicago		Portland	San Francisco		DC
	Barton Springs Road	*Bluebonnet Lane*	*Rio Grande St*	*N/S Dearborn St*	*N Milwaukee Ave*	*NE Multnomah St*	*Fell St*	*Oak St*	*L Street NW*
Length (miles)	0.5	0.7	0.4	1.2	0.8	0.8	0.3	0.3	1.12
# Signalized Intersections	4	0	2	13	7	10	4	4	15
# Unsignalized Intersections	2	15	5	0	5	3	0	0	0
ADT	23-28k	3.5k	5k	8-16k	12k	10k	28k	30k	12-14k
Transit stops on route	✓			✓	✓	✓			
Speed Limit	35	30	30	30	30	25	30	30	25
85% Speed (MPH)	34-36	30-32	21	n/a	36	28	n/a	30.5	n/a

Study Routes: Conversion

	Austin			Chicago		Portland	San Francisco		DC
	Barton Springs Road	*Bluebonnet Lane*	*Rio Grande St*	*N/S Dearborn St*	*N Milwaukee Ave*	*NE Multnomah St*	*Fell St*	*Oak St*	*L Street NW*
Construction Timeframe	Spring 2013	Aug-12	Apr-12	Nov./ Dec. 2012 and May 2013	April/May 2013	Fall 2012/ Winter 2013	Spring /summer 2013	Spring /summer 2013	Oct-12
BL Placement (in relation to traffic)	Right	Right	Left	Left	Right	Right	Left	Right	Left
Bike Lane Width (representative)	5'-7'	5' + 5'	6.5' + 5.5'	5' + 4'	7'	4'-7'	7'3"	7'3"	8'
Typical Buffer Width	1.5'	2'	4'	3'; 8' parking strip	2-4'; 9' parking strip	2'-8'	5'	5'	3'
# Bicycle Signals	1	0	1	12 to 13	1	0	0	0	0
Loss of MV Travel Lane	No	No	In places	One lane	Turn or bus lane, in places	One lane in each direction	No	No	In places
Net Loss of Parking	No	~150	No	21	69	+27 gained	28	27	151