

Factors Associated with the Bicycle Commute Use of Newcomers: An analysis of the 70 largest U.S. Cities

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Newcomers and Bicycles



Photo Credit: Daveena Tauber

Presentation Outline

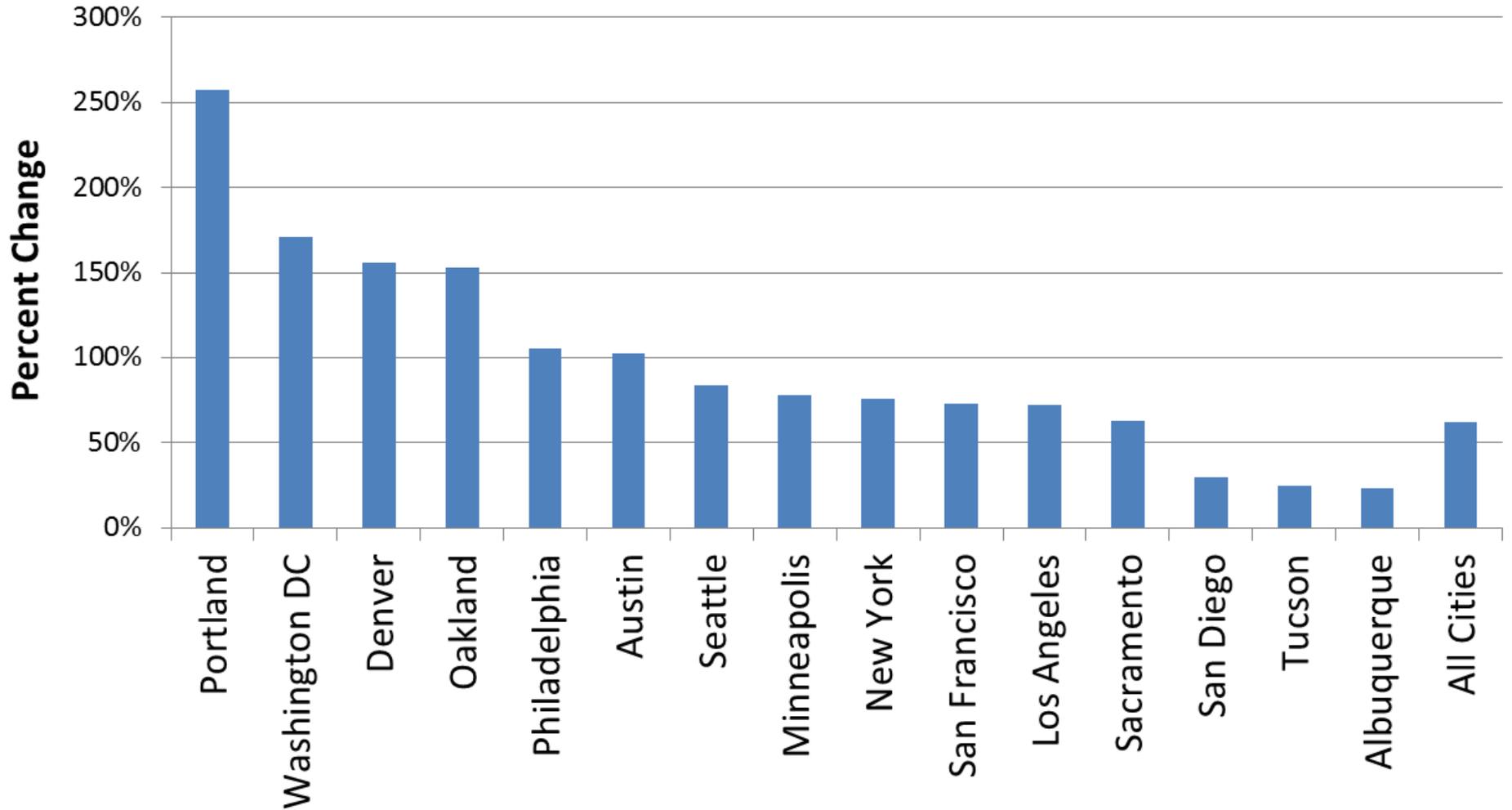
- Introduction to Newcomers and Bicycle Use
- ACS data and my study
- Results and implications
- Limitations of ACS data
- My future research and ACS data

Background on Bicycling

- Benefits of bicycling are becoming well known.
- Cities are making substantial investments to encourage bicycle use.
- Levels of bicycle use are increasing.
 - Since 2000, bicycle commuting in the U.S. has increased by 62%¹
 - Largest percentage increase of all commuting modes
- Some cities are seeing larger increases in bicycle use than others.

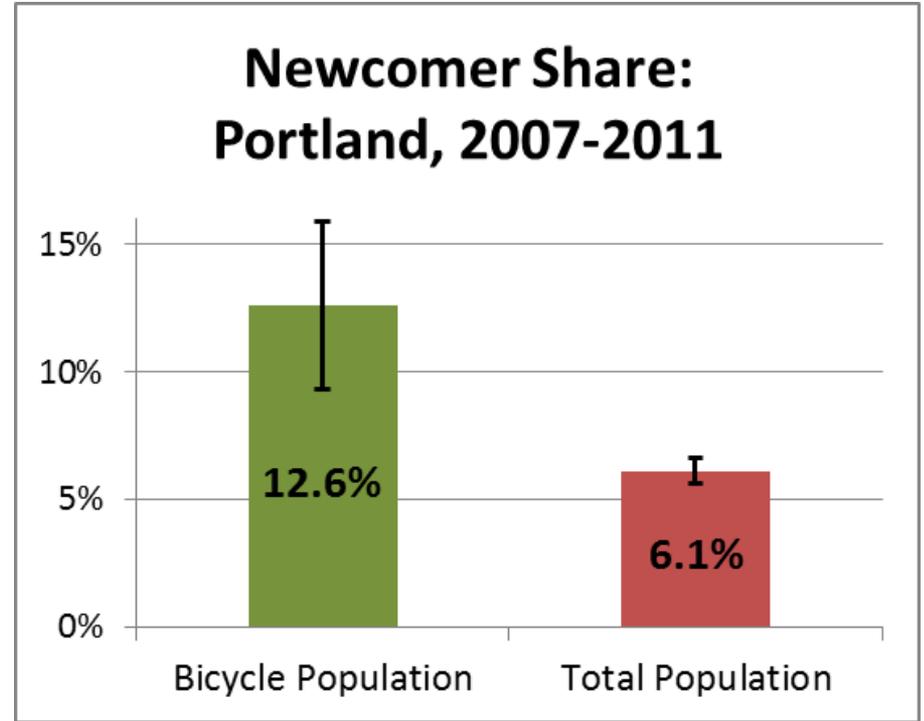
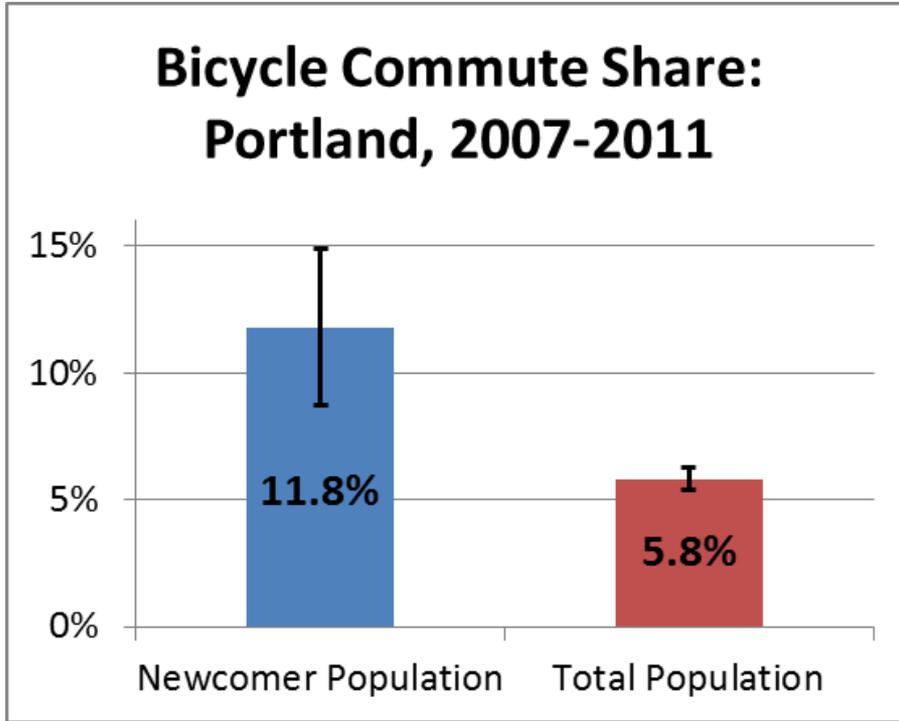
¹ 2000 US Census Decennial Survey & 2012 ACS 1-year estimates

Percent Change in Bicycle Commute Use for Selected Cities, 2000-2011



Source: 2000 US Decennial Census & 2011 ACS 1-Year Estimates

Newcomers to Portland

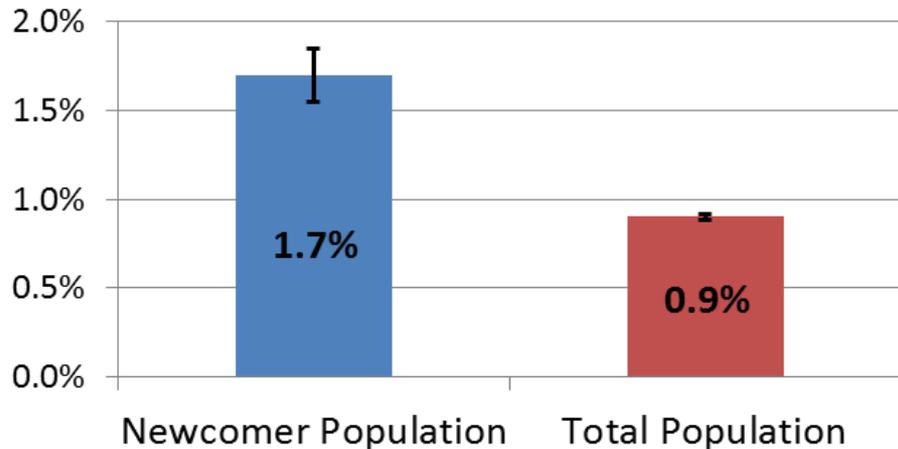


Data Source: Workforce Population 2007-11 ACS PUMS 5-year Estimates

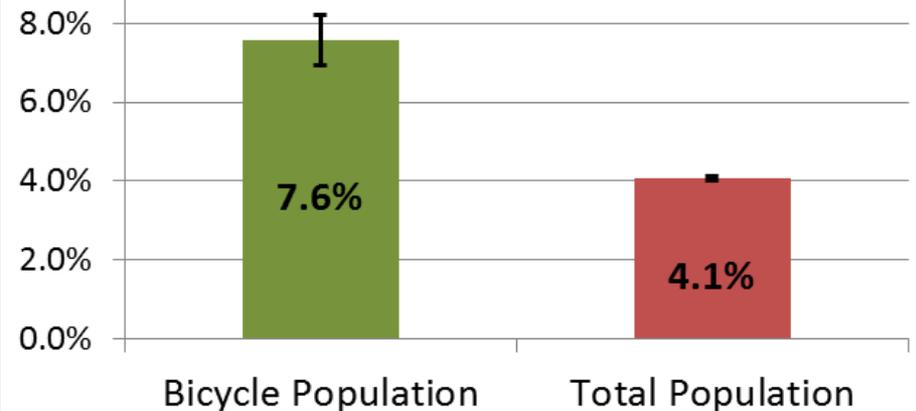
All things being equal, the odds of a Portland ***newcomer*** (i.e. **someone who moved within the past year**) bicycling to work were 50% greater than those of a pre-existing resident (Dann, 2014).

Newcomers in Major U.S. Cities

**Bicycle Commute Share:
70 Largest U.S. Cities, 2007-2011**

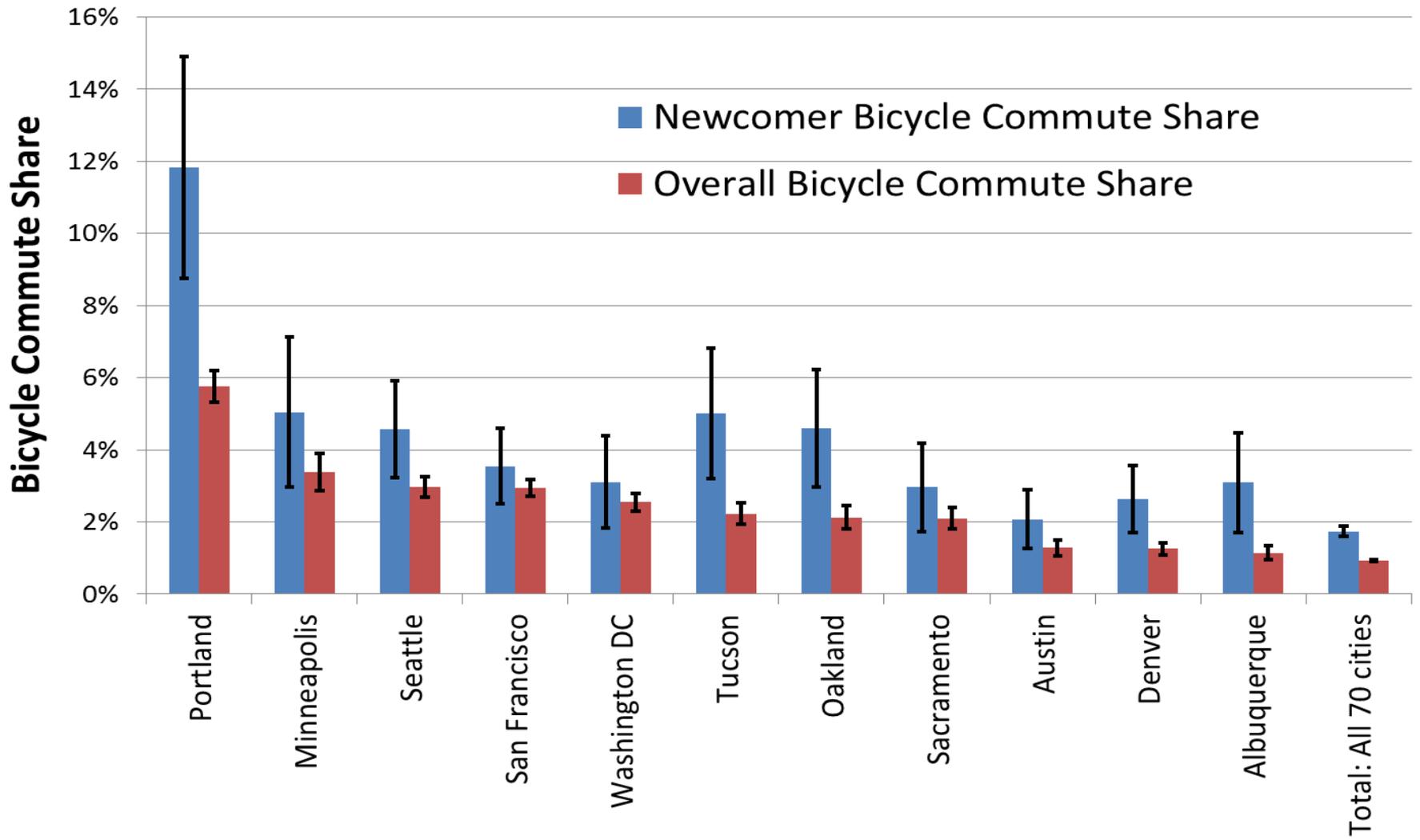


**Newcomers Share:
70 Largest U.S. Cities, 2007-2011**



Data Source: Workforce Population 2007-11 ACS PUMS 5-year Estimates

Newcomer and Overall Bicycle Commute Share for Selected Cities, 2007-2011 ACS 5-Year Estimates



Data Source: Workforce Population 2007-11 ACS PUMS 5-year Estimates

Cities are fighting to attract bicyclists

"... I expect not only to take all of their [Portland and Seattle's] bikers but I also want all the jobs that come with this."

– Chicago Mayor Rahm Emanuel, 2012²

"Mayor Rahm Emanuel, when he announced bike routes in downtown Chicago, called out Seattle, saying he wanted our bikers and our tech jobs. We're going to work to keep them here."

– Seattle Mayor Mike McGinn, 2013³

² gridchicago.com December 14, 2012

³ seattlebikeblog.com February 20, 2013

Could we be in the midst of a “Legs Race”?



Research Goals

Why this study is important:

- Explores the relationship between bicycle use and inter-regional self-selection (i.e. newcomers)
- Provides a greater understanding of why and how some cities are attracting bicycle users
- Allows cities to gauge the types of individuals they are attracting when targeting bicycle users

Data and Methods

Dataset: American Community Survey (ACS) Public Use Microdata Sample (PUMS) 2007-2011 5-year estimates

Sample: Employed *newcomers* in 70 most populous US cities in 2012

Independent Variables: Individual level demographic factors and city-wide commuting levels

Bicycle infrastructure⁴: Total miles of bicycle lanes and paths per square mile of land (Buehler & Pucher, 2012)

Dependent Variable: Bicycle commuter

⁴ Retrieved from the Alliance for Biking & Walking, *Bicycling and Walking in the U.S. 2012 Benchmarking Report*, January 2012.

Data Sample Definitions

Bicycle commuter - An individual who self-reported that they used a bicycle as their primary means of transportation to work

– Bicycle commute use:

“How did this person usually get to work LAST WEEK?”⁵

Newcomer - An individual who moved to a new metropolitan region within the past year

– Newcomer status:

“Did this person live in this house or apartment 1 year ago?”⁶

⁵ 2011 ACS

⁶ Ibid

Descriptive Results

70 Largest U.S. Cities, 2007-2011

Socio-Demographics	ALL Newcomers	Newcomer Bicyclists
Count	723,004	14,231
Bicycle Commute Use	1.9%	100.0%
Median Age	33	29
Sex (Male)	51%	65%
Race (White, Non-Hispanic)	59%	78%
Relationship Status (Single/Never Married)	59%	75%
Educational Attainment (Bachelor's+)	37%	60%
Median Income	\$14,000	\$19,200

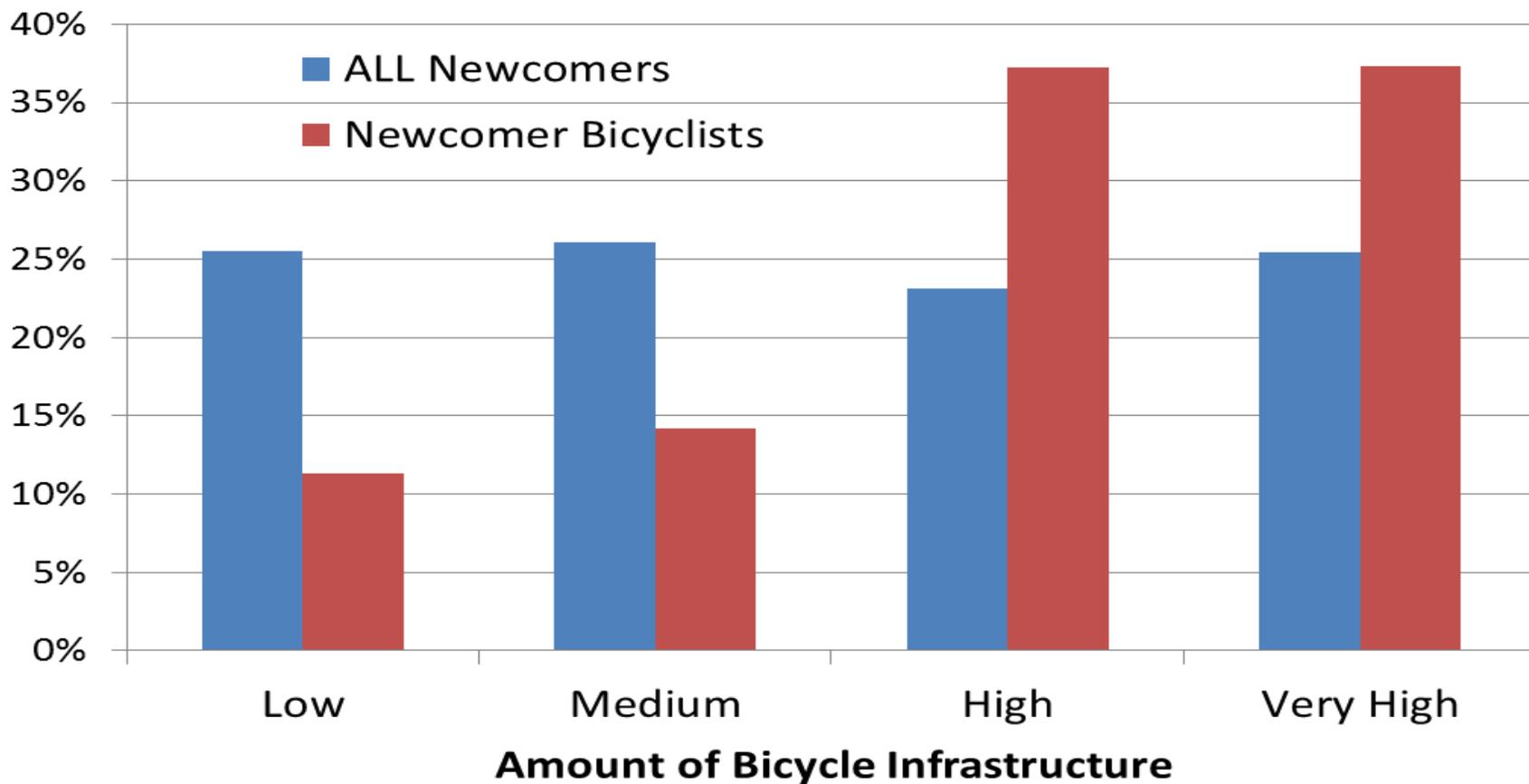
Source: 2007-2011 ACS PUMS 5-year Estimates

Descriptive Results

70 Largest U.S. Cities, 2007-2011		
Regional Variables	ALL Newcomers	Newcomer Bicyclists
New England	2%	2%
Middle Atlantic	12%	13%
East North Central	10%	6%
West North Central	5%	4%
South Atlantic	12%	7%
East South Central	5%	3%
West South Central	19%	10%
Mountain	12%	15%
Pacific	24%	41%

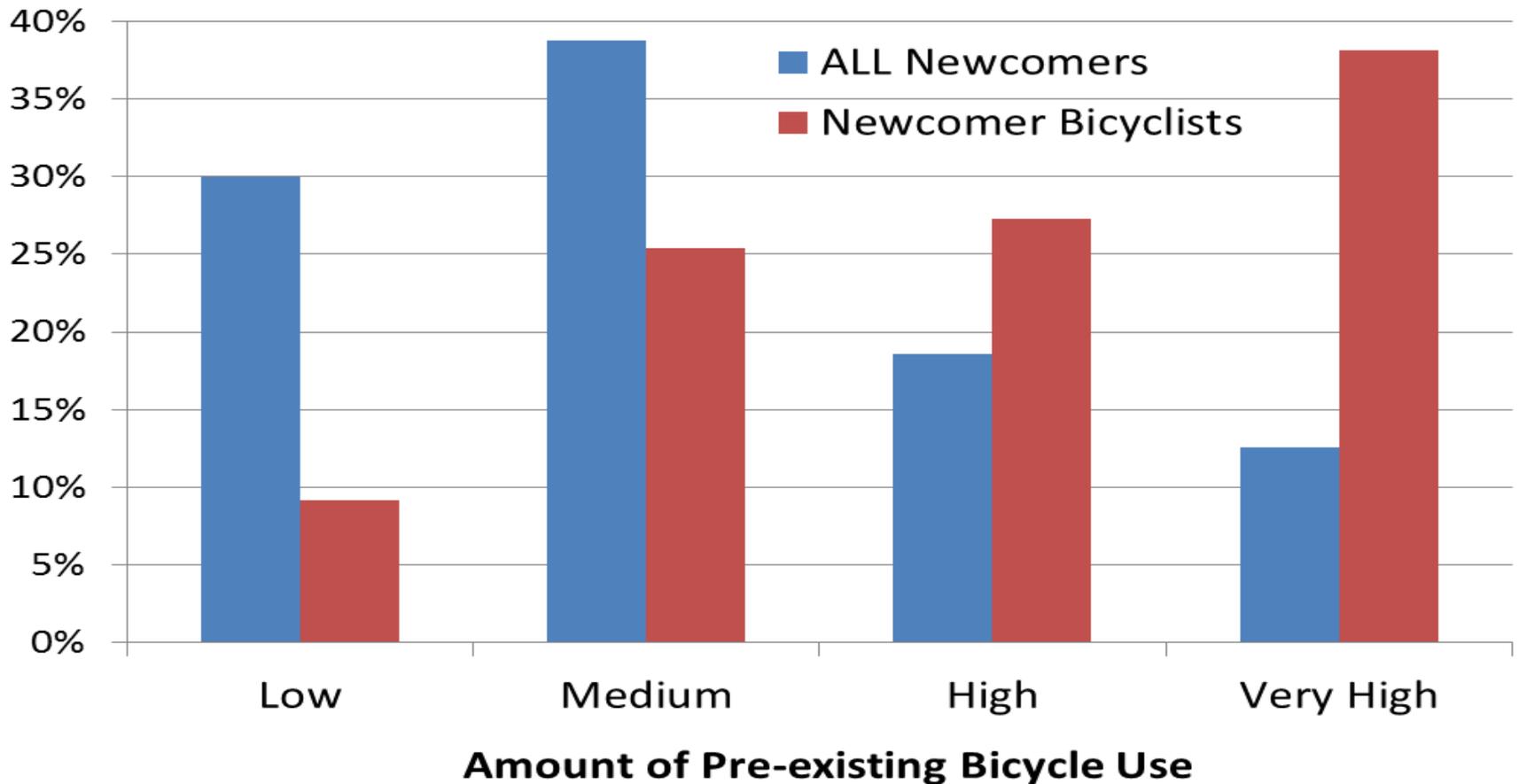
Source: 2007-2011 ACS PUMS 5-year Estimates

Where Newcomers Move: Bicycle Infrastructure



Source: 2007-2011 ACS PUMS 5-year Estimates

Where Newcomers Move: Pre-Existing Bicycle Use



Source: 2007-2011 ACS PUMS 5-year Estimates

Bivariate Logistic Regression - Newcomers: Likelihood of Using a Bicycle for Commuting

Explanatory variable	Block 1			Block 2			Block 3		
	Coefficient	Odds ratio		Coefficient	Odds ratio		Coefficient	Odds ratio	
Constant	-6.28			-6.93			-7.77		
Individual Factors									
Male	0.67	***	1.96	0.70	***	2.01	0.70	***	2.02
White	0.77	***	2.16	0.68	***	1.98	0.69	***	2.00
Single/Never Married	0.37	***	1.45	0.27	***	1.31	0.30	***	1.35
Bachelors Degree or Higher	0.54	***	1.72	0.46	***	1.58	0.50	***	1.64
Physical Environment Factors									
Bicycle Infrastructure	0.43	***	1.54	0.08	***	1.09	0.36	***	1.35
Social Environment Factors									
Pre-existing Bicycle Use				0.69	***	1.99	1.11	***	2.63
Physical/Social Interaction Factor									
Interaction (Infrastructure & Pre-existing Bicycle Use)							-0.14	***	0.87
-2 Log Likelihood[^]			159776.24			154076.64			152645.24
McFadden's R2			0.062			0.096			0.104
Number of Observations			956,601			956,601			956,601
^ Initial - 2 Log Likelihood: 170393.052									

***p <0.01, **p <0.05

Dann, 2014

Conclusion and Discussion

Newcomers have much greater odds of being bicycle commuters if they are... Male and White.

It doesn't hurt if they are single or college educated.



Photo Credit: Mark Kenseth

Conclusion and Discussion

Bicycle infrastructure appeared to only play a role in predicting newcomer bicycle use when pre-existing levels of bicycle use were *very low*.

The greatest overall determinant of newcomer bicycle use was...

pre-existing levels of bicycle use.

Conclusion and Discussion

Bicyclists like being near other bicyclists.

- Safety in numbers
- Bicycle culture
- Other lifestyle amenities

Bicycle infrastructure has a limited ability to attract new bicyclists.

- Infrastructure usually lags behind demand
- Not all bicycle infrastructure is created equal
- U.S. bicycle infrastructure is not state-of-the-art

Limitations

- Work trips only make up 22% of all household trips⁷.
- When does a newcomer become a long-time resident?
- Are cities 'magnets' or 'catalysts' for bicycle use?

⁷ 2009 National Household Travel Survey

ACS: Commute Data

While commute trips represent only 22% of all bicycle trips, the commute trip is still king:

- Congestion
- Peak travel period
- Most bicycle crashes or injuries
- Measures social equity

ACS: Limitations

- Sample reliability and margins of error
 - Can only ‘slice and dice’ the data in so many ways
 - We miss out entirely on smaller populations
- Data from 5-year estimates aren’t ‘fresh’
 - Bicycle use can dramatically change in 5 years
- PUMS data masks variations within a city
 - Bicycle use and migration patterns aren’t evenly distributed within cities

ACS: Looking Forward

- 2010-2014 ACS 5-Year Estimates
 - Trend analysis
- Larger populations of bicycle users
 - Increases in sample reliability
- New PUMA boundaries
 - 2012 ACS data uses 2010 Census PUMAs
- Regional differences
 - Does it matter where you came from or where you go?

