



Cycling for Sustainable Cities

19 October 2021

Today's moderators

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Acknowledgment of country

We acknowledge the Australian Aboriginal and Torres Strait Islander peoples as the first inhabitants of the nation and the traditional custodians of the lands where we live, learn and work. We pay our respects to Elders past, present and emerging for they hold the memories, traditions, culture and hopes of Aboriginal and Torres Strait Islander peoples of Australia.

Austrroads acknowledges and respects the Treaty of Waitangi and Maori as the original people of New Zealand.

Webinar organisers

The webinar is facilitated by Austroads, in partnership with Cycling and Walking Australia and New Zealand (CWANZ), We Ride Australia and the Heart Foundation.

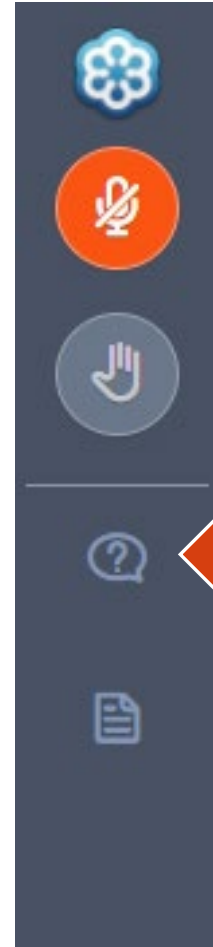


Housekeeping



Presentation = **75 mins**

Question time = **15 mins**



Type questions here

Let us know the slide number your question relates to

Today's presenters



John Pucher



Ralph Buehler

Cycling for Sustainable Cities

How to make city cycling safe and convenient for everyone



Ralph Buehler and John Pucher

**How to make
city cycling
safe and
convenient
for everyone**

**MIT Press, 2021,
464 pages**

Cycling ^{for} Sustainable Cities



edited by **Ralph Buehler**
and **John Pucher**

Book Chapters and Authors

INTRODUCTION AND OVERVIEW

1 Introduction: Cycling to Sustainability

John Pucher and Ralph Buehler

2 International Overview of Cycling

Ralph Buehler and John Pucher

SPECIFIC CYCLING TOPICS

3 Cycling and Health

Jan Garrard, Chris Rissel, Adrian Bauman, and Billie Giles-Corti

4 Cycling Safety

Rune Elvik

5 Bicycling Infrastructure for All

Peter G. Furth

SPECIFIC CYCLING TOPICS

6 Bicycle Parking

Ralph Buehler, Eva Heinen, and Kazuki Nakamura

7 Programs and Policies Promoting Cycling

Eva Heinen and Susan Handy

8 Evaluation of Cycling Policies and Projects

Bert van Wee

9 E-bikes in Europe and North America

Christopher R. Cherry and Elliot Fishman

10 Bikesharing's Ongoing Evolution and Expansion

Elliot Fishman and Susan Shaheen

11 Women and Cycling: Addressing the Gender Gap

Jan Garrard

12 Children and Cycling

Noreen McDonald, Eleftheria Kontou, and Susan Handy

SPECIFIC CYCLING TOPICS

13 Older Adults and Cycling

Jan Garrard, Jennifer Conroy, Meghan Winters, John Pucher, and Chris Rissel

14 Social Justice and Cycling

Karel Martens, Aaron Golub, and Andrea Hamre

COUNTRY AND CITY CASE STUDIES

15 Cycling in China and India

John Pucher, Geetam Tiwari, Zhong-Ren Peng, Rong Cao, and Yuan Gao

16 Cycling in Latin America

Carlosfelipe Pardo and Daniel A. Rodriguez, with Lina Marcela Quiñones

17 Cycling in New York, London, and Paris

John Pucher, John Parkin, and Emmanuel de Lanversin

COUNTRY AND CITY CASE STUDIES

18 Cycling in Copenhagen and Amsterdam

Till Koglin, Marco te Brömmelstroet, and Bert van Wee

19 Implementation of Pro-bike Policies in Portland and Seville

Roger Geller and Ricardo Marqués

20 Cycling Advocacy in Europe, North America, and Australia

John Pucher, Bernhard Ensink, Tim Blumenthal, Bill Nesper, Ken McLeod, Andy Clarke, Jean-François Pronovost, Dave Snyder, Robin Stallings, Fiona Campbell, and Peter Bourke

21 Cycling to a More Sustainable Transport Future

Ralph Buehler and John Pucher

Cycling is very sustainable

Environmentally friendly:

- > Virtually no pollution at all
- > Few nonrenewable resources used

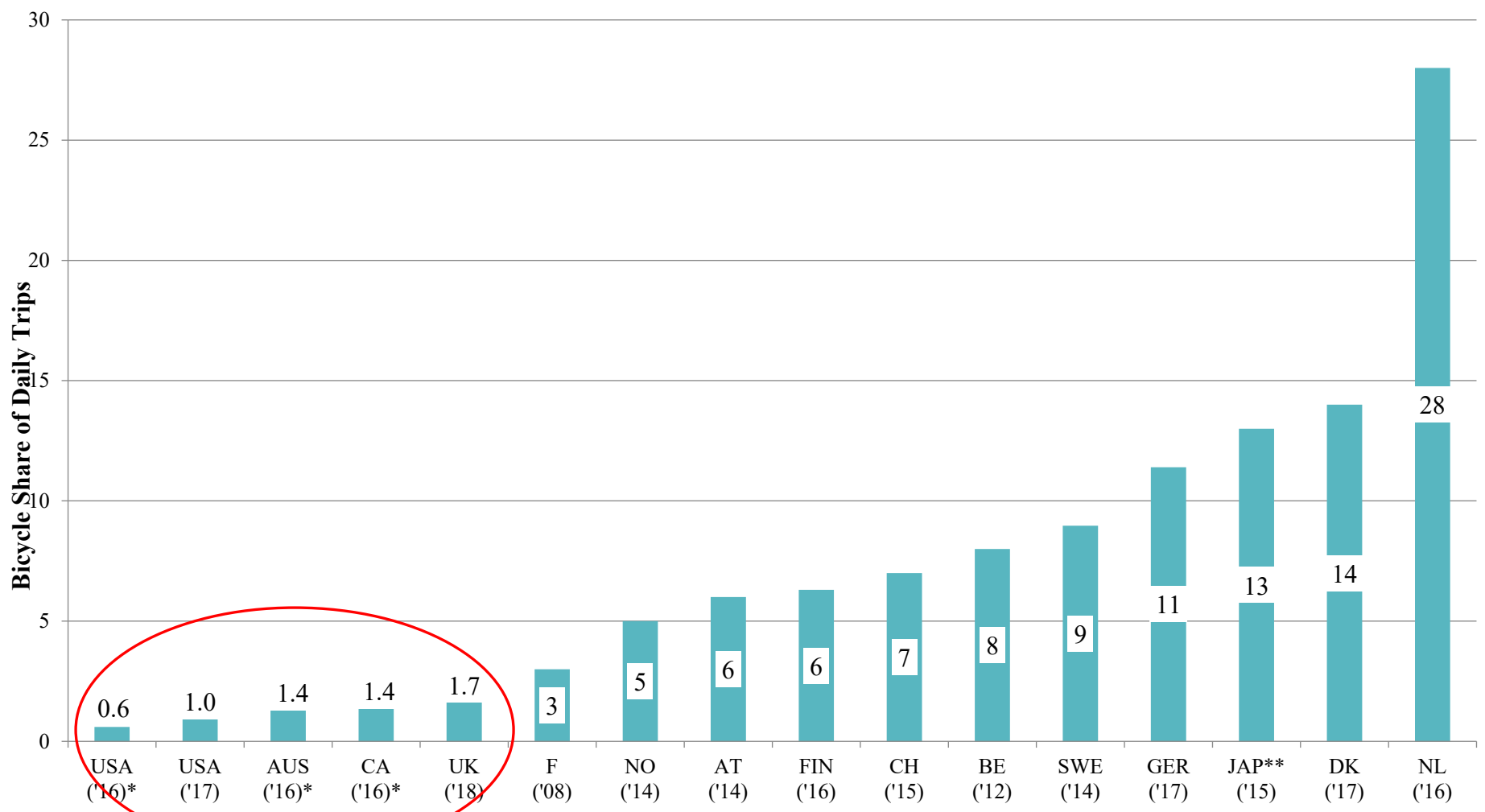
Economical:

- > Low private and public costs
- > Improved health from cycling can reduce medical costs for individuals and society

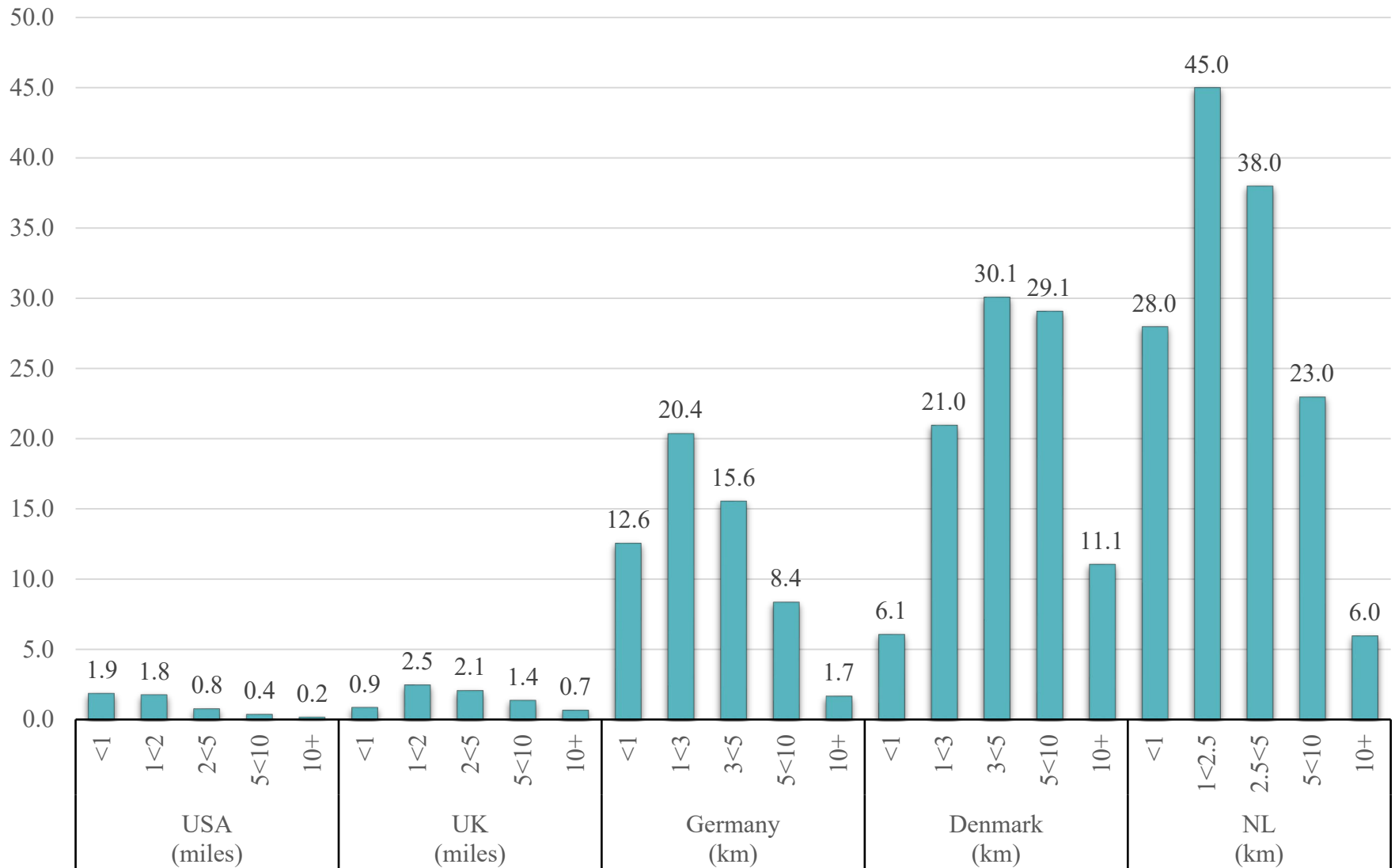
Socially sustainable:

- > Financially affordable for almost everyone
- > Physically possible for most
- > Physical, mental, and social health benefits

Cycling share of daily trips in Europe, North America, Australia, and Japan, 2008-2017

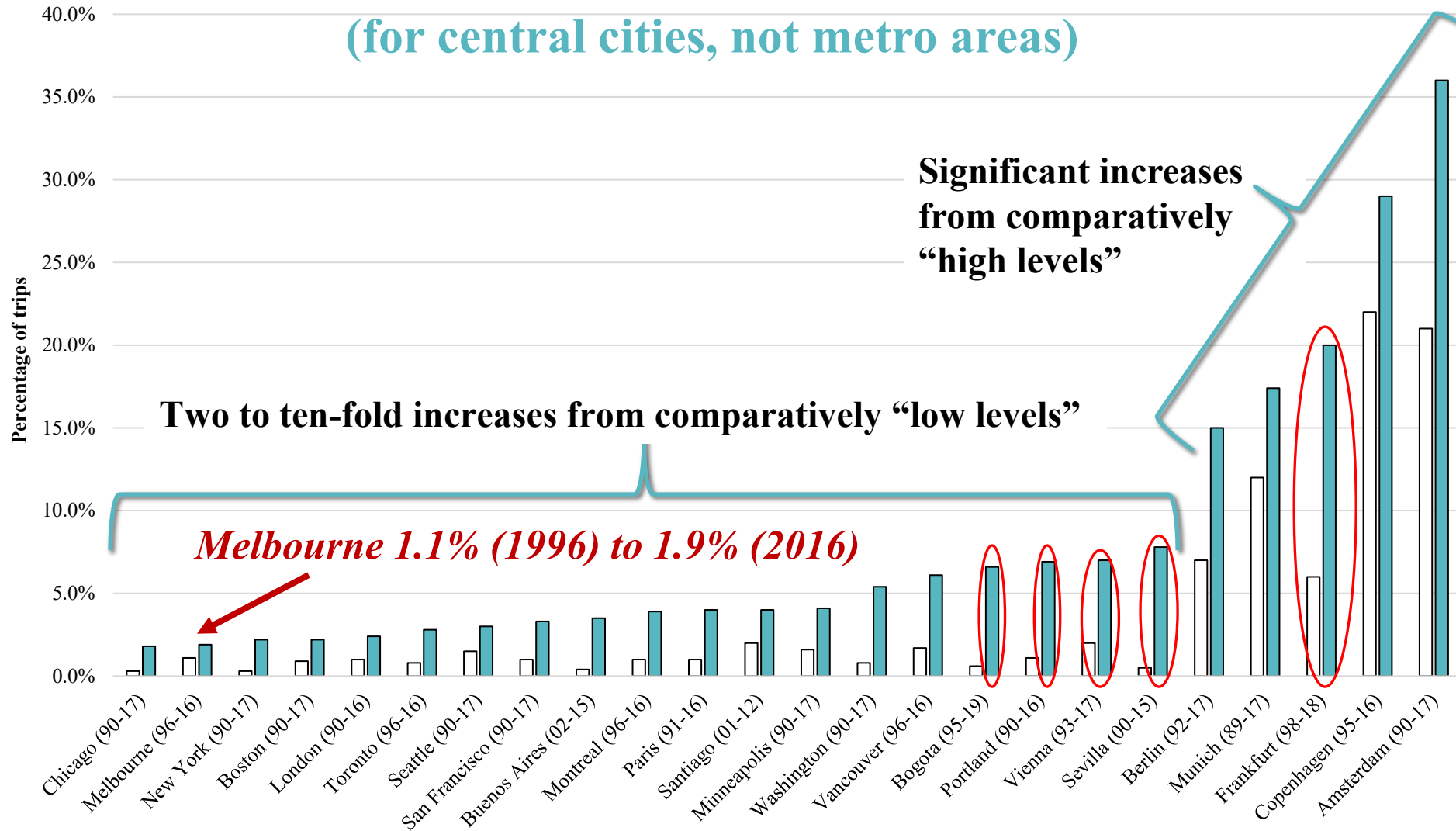


Share of cycling by trip distance



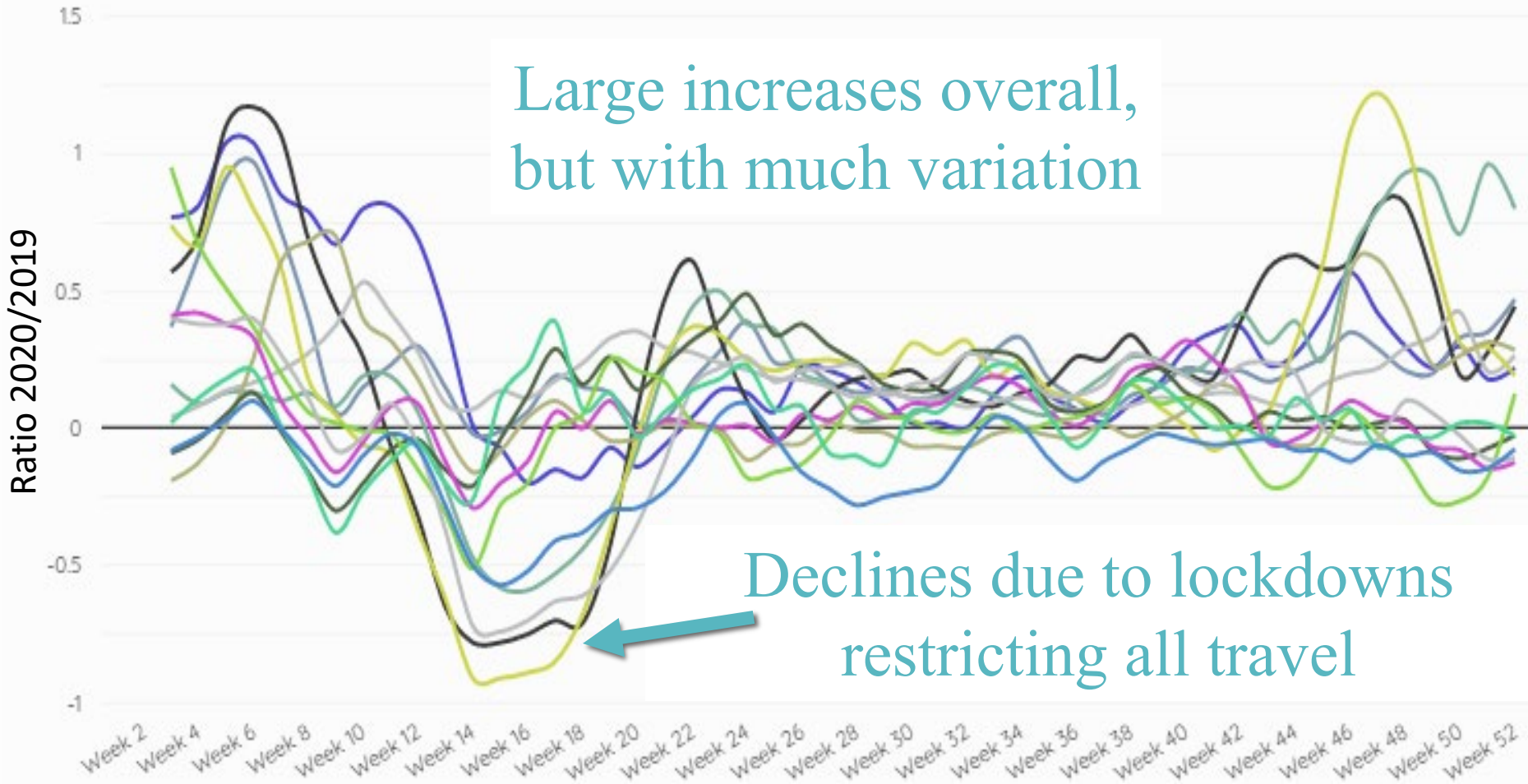
Increasing bike mode shares in large cities of Europe and the Americas, 1990-2017

(for central cities, not metro areas)



Impacts of COVID on Cycling

Finland Sweden Italy Portugal USA Spain Canada
United Kingdom Germany Austria France Belgium Ireland



Impacts of COVID on Cycling

Overall: Increases in cycling volumes and cycling share of trips

But: Much variation by month, time of day, location, and purpose

- Increases for exercise, recreation, getting outdoors, relief from stress
- Increases in afternoon and early evening cycling
- Largest increases in weekend cycling
- Largest increases in cycling on off-road recreational paths
- Decreases in morning peak hour cycling
- Decreases in utilitarian cycling

2020: Rue de Rivoli in Paris converted to cycling street



Source: City of Paris

2021: 30km/h (19mph) speed limit citywide in Paris

(Similar to 20mph limit in Inner London)



Montreal installed 68km of new or improved cycling facilities in 2020, mostly with physical separation from motor vehicle traffic

Source: Bartek Komorowski

Outdoor Dining and Bike Lane, Cambridge



Source: Kyle Klein, City of Cambridge

Closed Street in Cambridge



Source: Kyle Klein, City of Cambridge

Shared Street in Boston



Source: Kyle Klein, City of Cambridge

Closed Street in Chicago



Source: Active Transport Alliance

Examples in the USA



Boylston
Street in
October 2020

Boylston Street in Boston Before July 2020

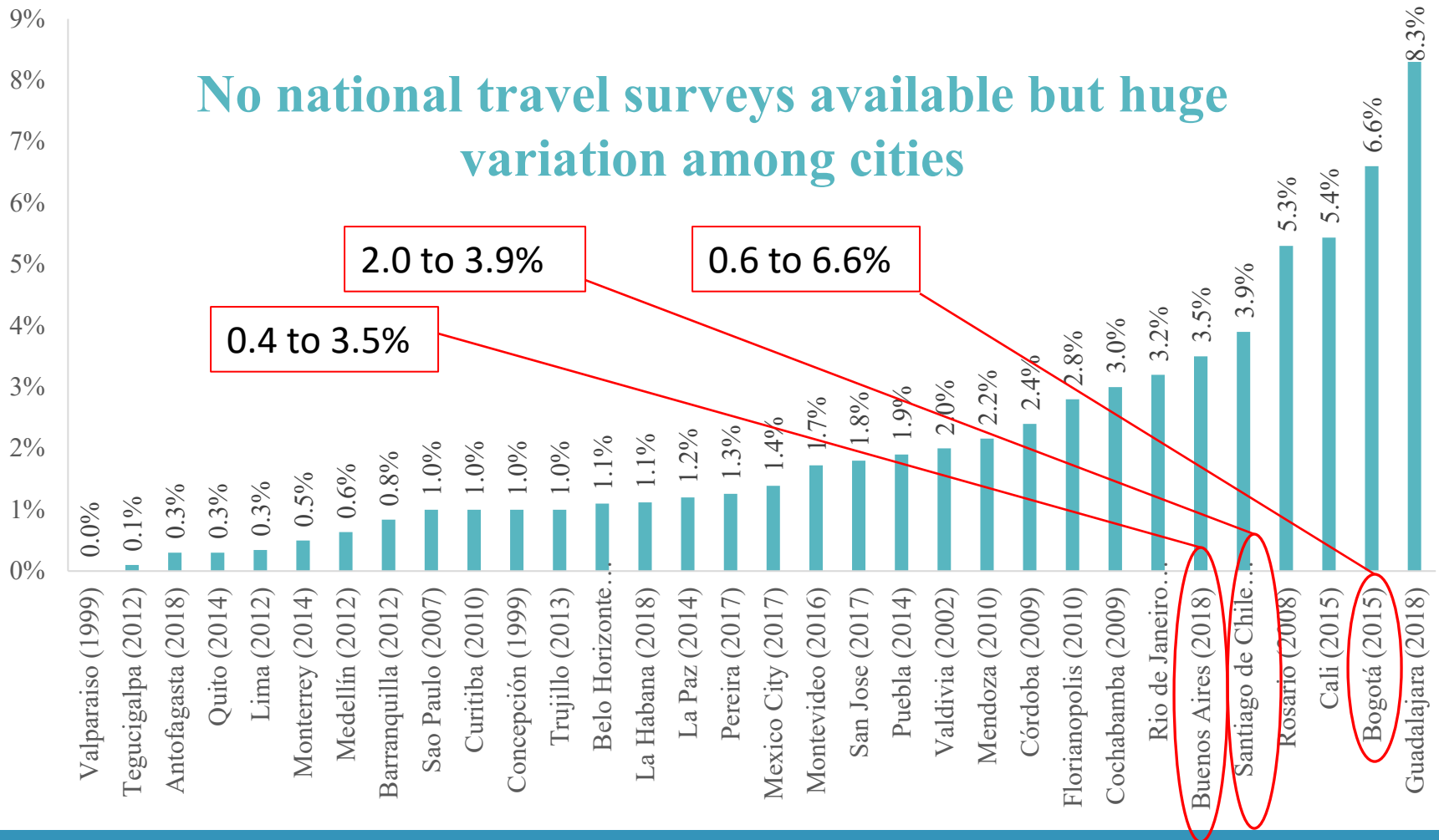
Source: City of Boston

Beach Avenue in Vancouver used by over 10,000 bicyclists on several days in summer 2020...

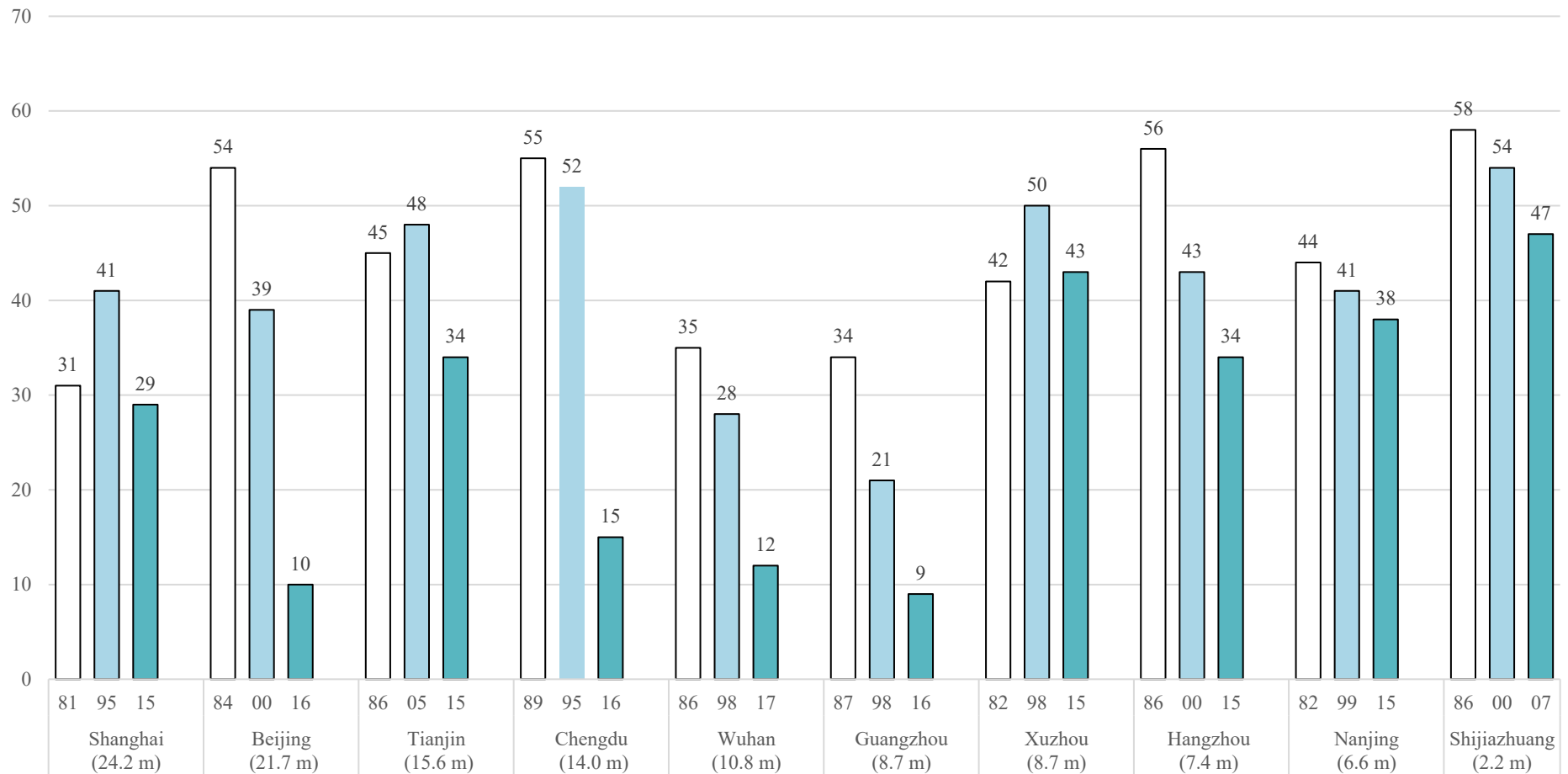


...later converted to protected bike lane with concrete curbs and remains one of Vancouver's busiest cycling routes.

Bicycle share of trips in Latin American Cities



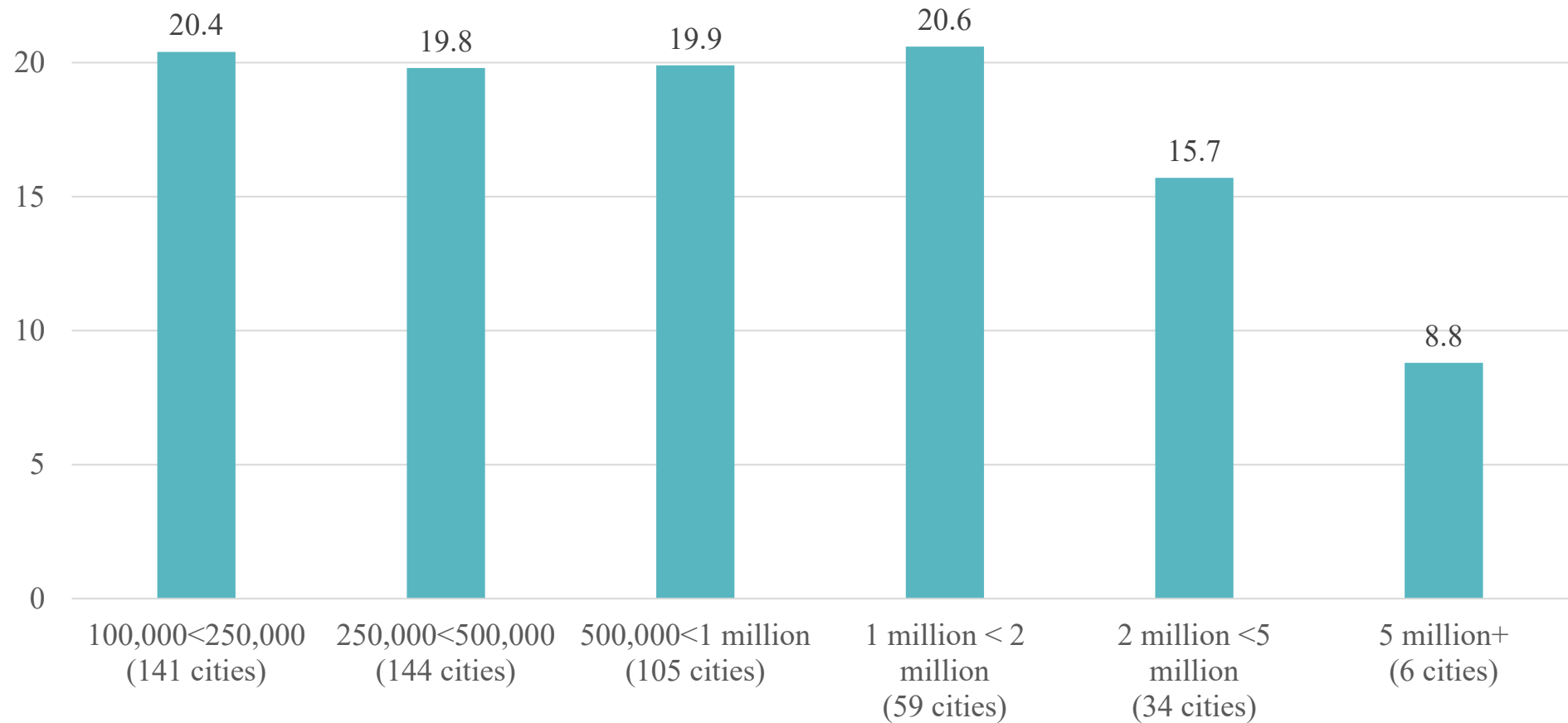
Bicycle Share of Trips in Large Chinese Cities Over Three Decades



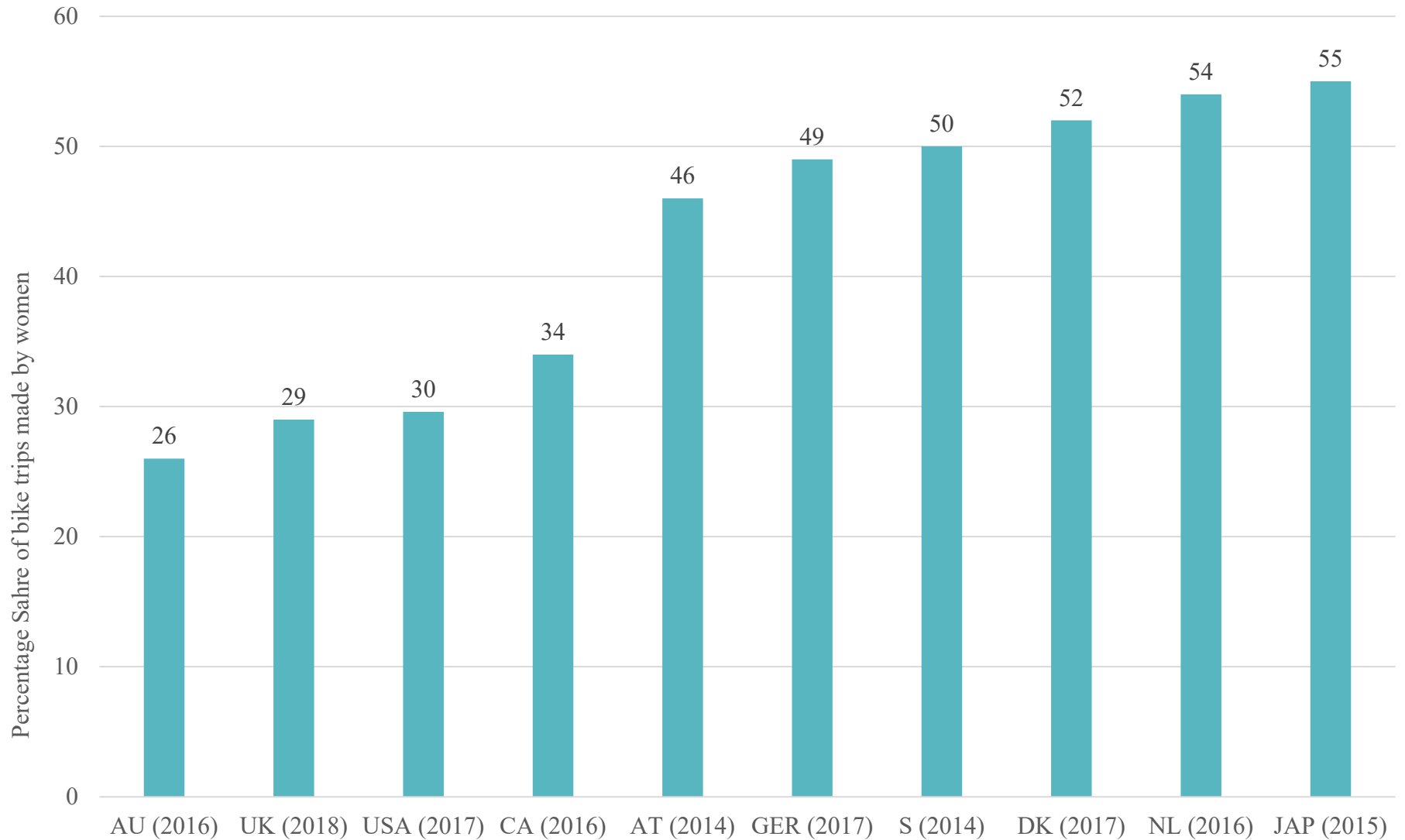
Source: Pucher et al. Ch. 15, in Buehler & Pucher (2021). *Cycling for Sustainable Cities*. MIT Press.

Bicycle Share of Daily Work Commuters in India by Population Size Category

Overall: 18% share in urban areas vs 22% in rural areas



Women's Share of Bike Trips





Over 50% of bike trips in Denmark and the Netherlands are by women



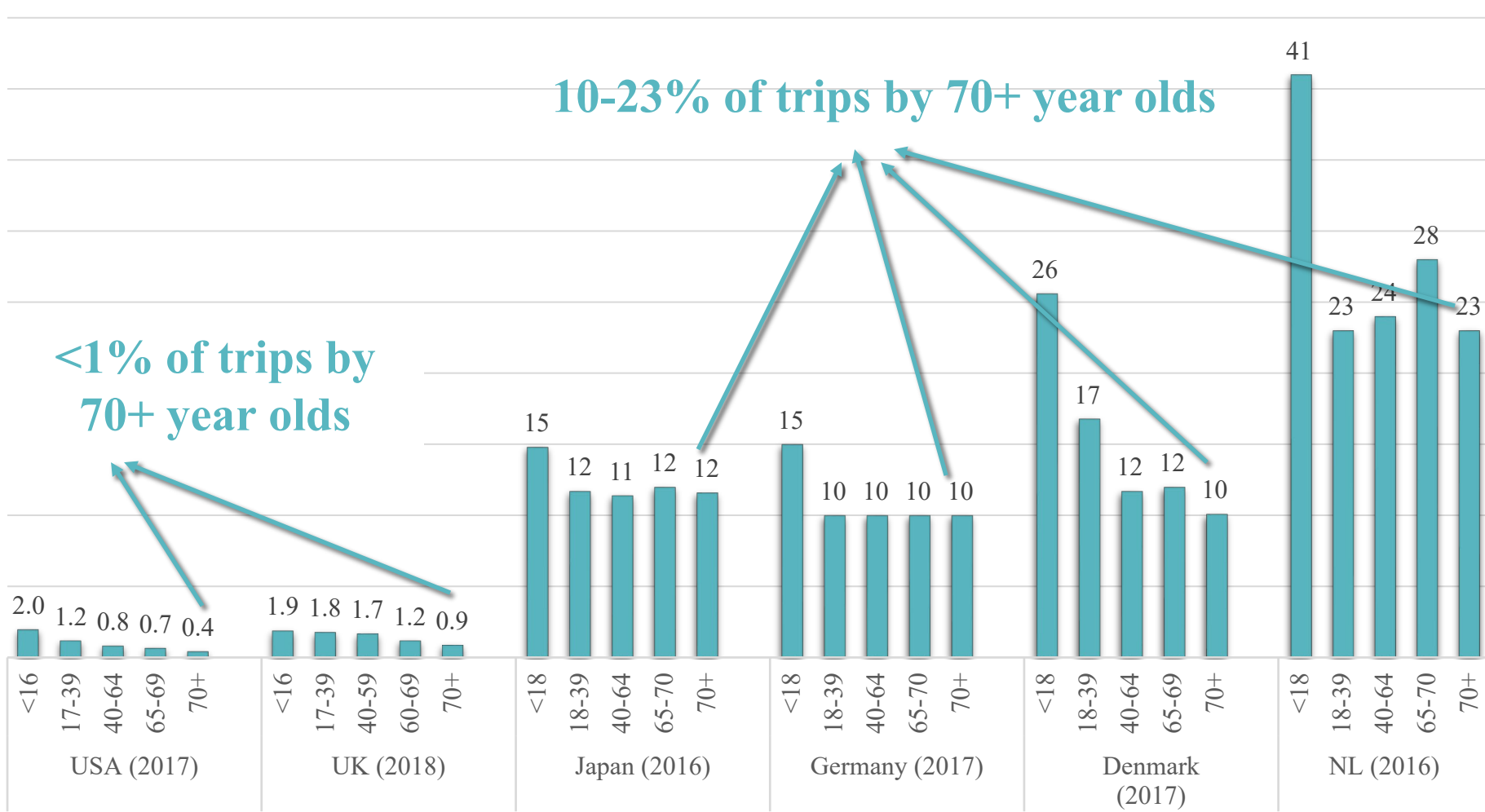
Cycling for all Ages



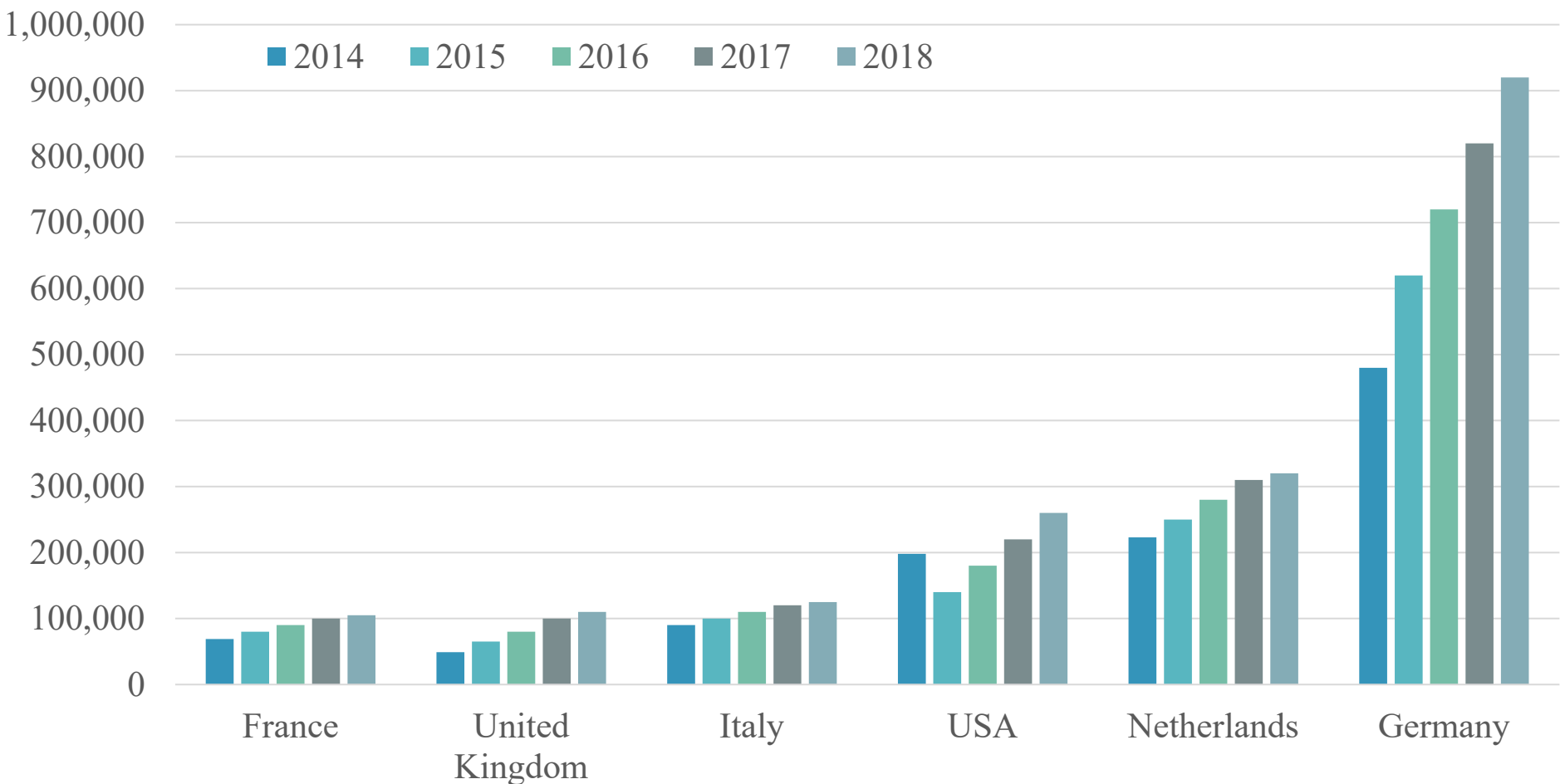
Foto by Marie Demers



Share of Cycling by Age Group



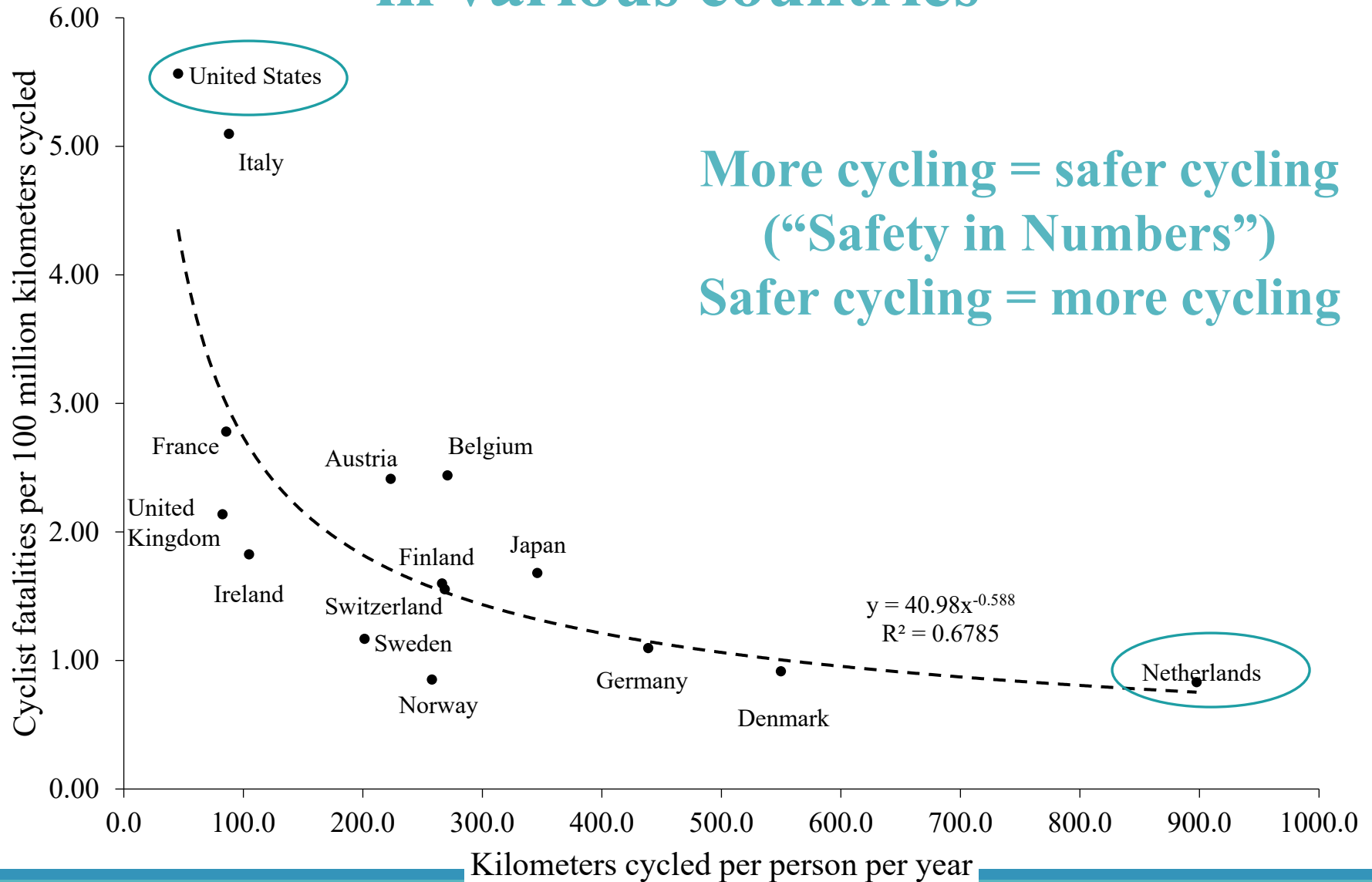
Growth in E-Bike Sales in Europe and the USA, 2014-2018



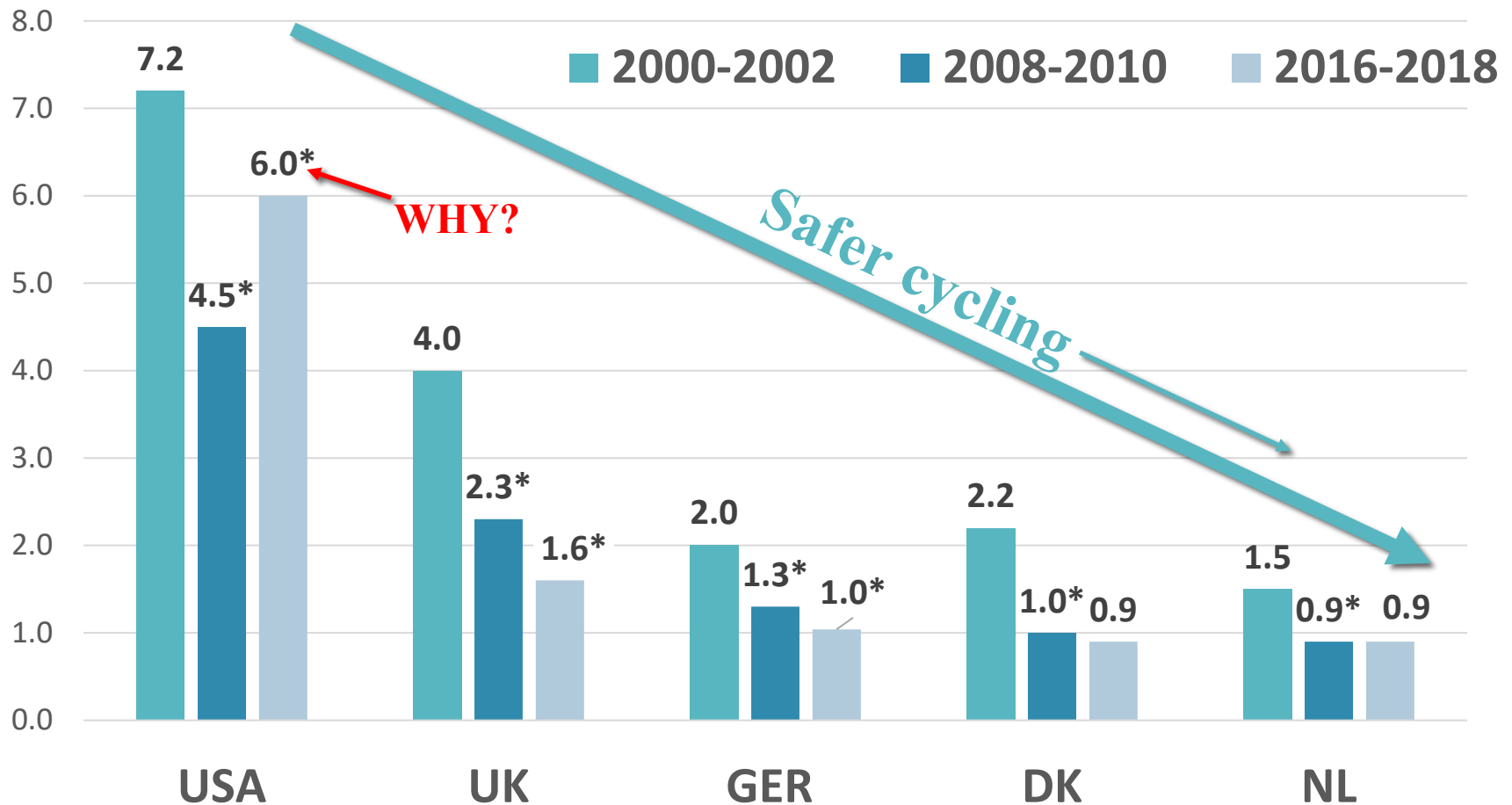
Crucial to Make Cycling Safe

- Especially important for the young, the old, for anyone with disabilities, for the timid or risk-averse
- Women more sensitive to safety than men
- Safety of cycling in the Netherlands, Denmark, and Germany helps explain higher levels of cycling there

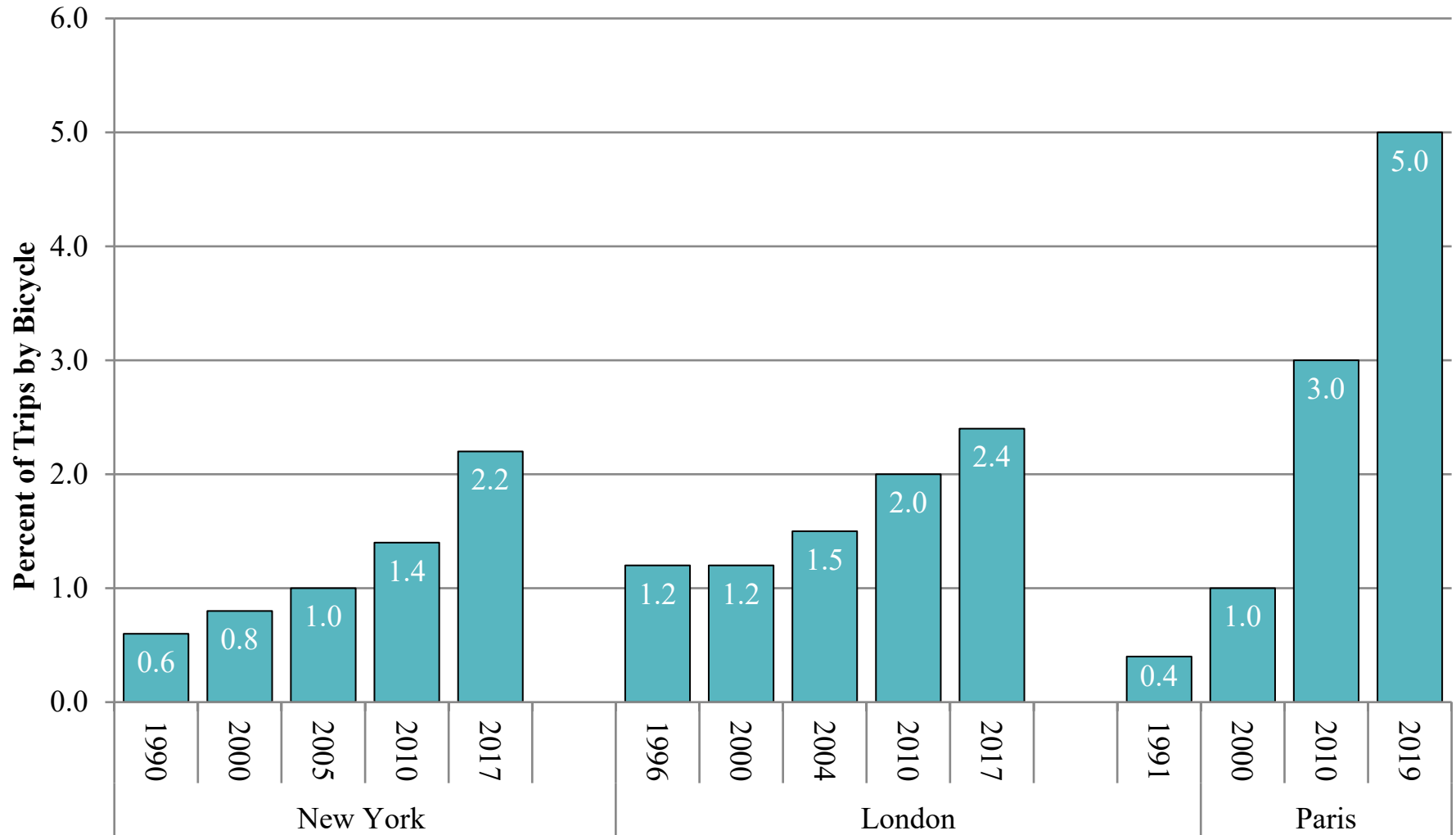
Cyclist fatality rates and amount of cycling in various countries



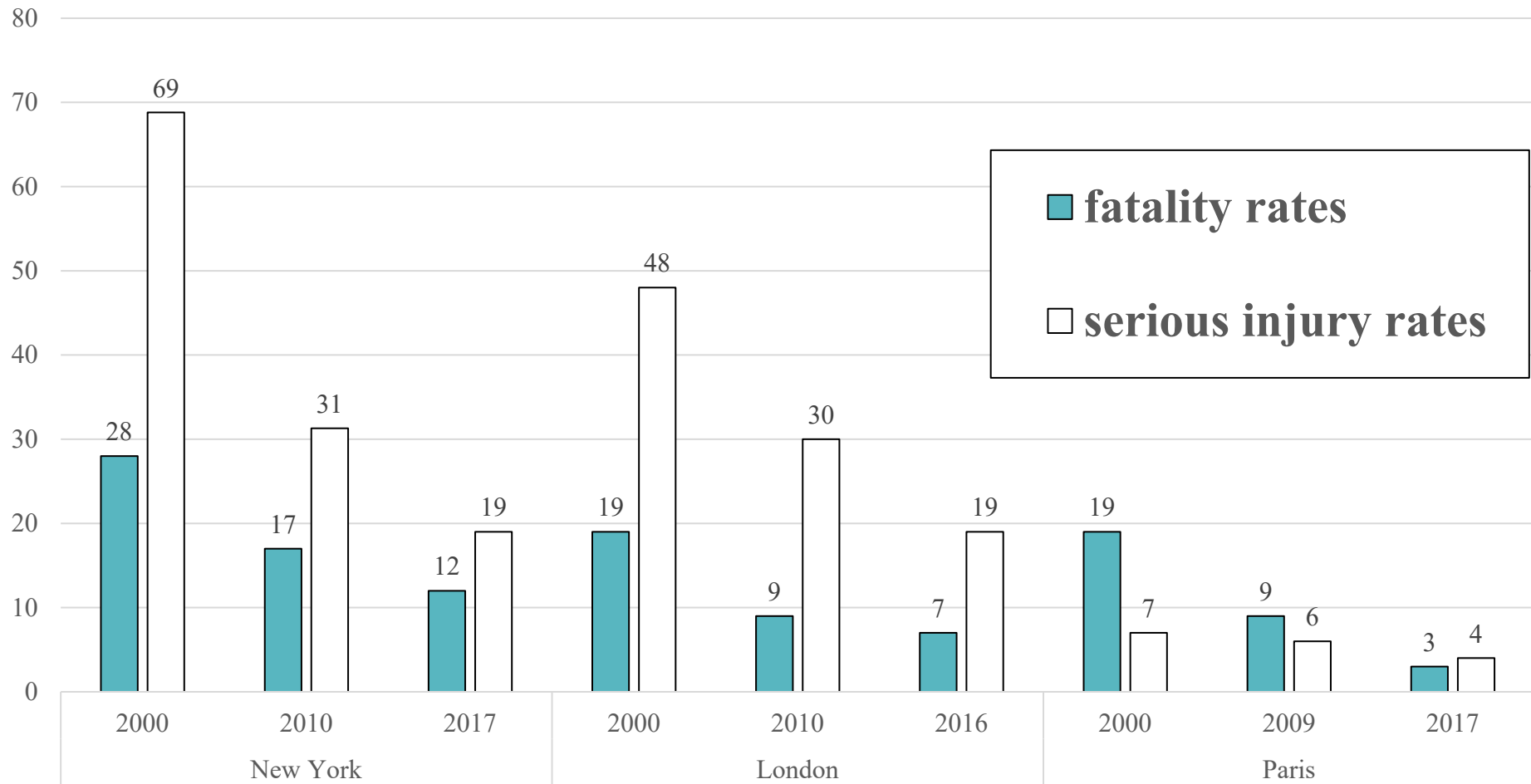
Cyclist fatality rate per 100 million kilometers cycled in the USA, the UK, Germany, Denmark, and the Netherlands, 2000-2018



Increase in bicycle mode share in New York, London, and Paris, 1990-2017



Decline in cyclist fatality and serious injury rates, 2000-2017



New York



London



Huge expansion in protected cycling facilities in all three cities



Photo: Tom Bogdanowicz

North-South Cycleway in London (Blackfriars Bridge)



Cycleway in tunnel

Photo: Tom Bogdanowicz

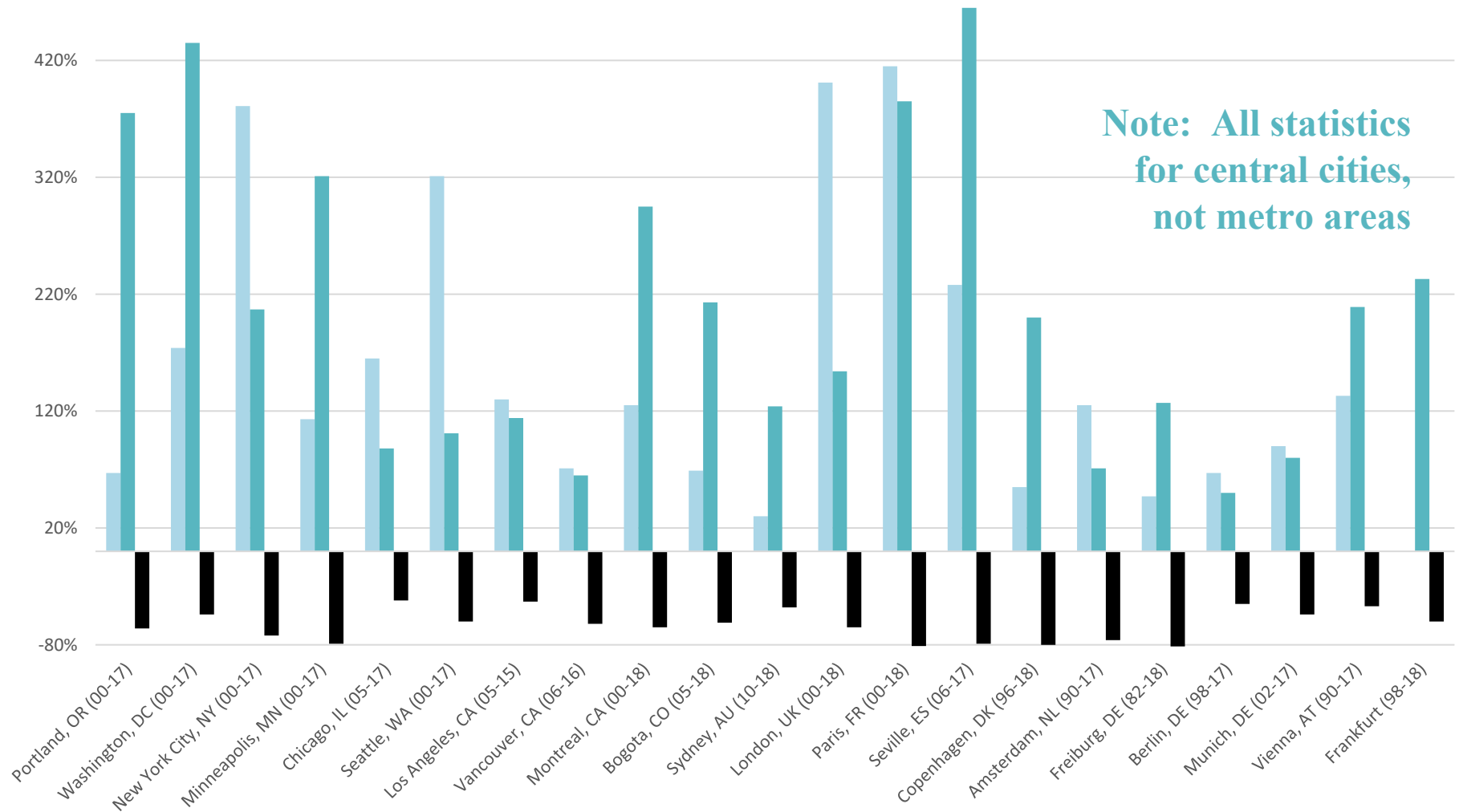
Protected Cycling Facility on Blackfriars Underpass⁹

How to encourage more cycling while improving safety

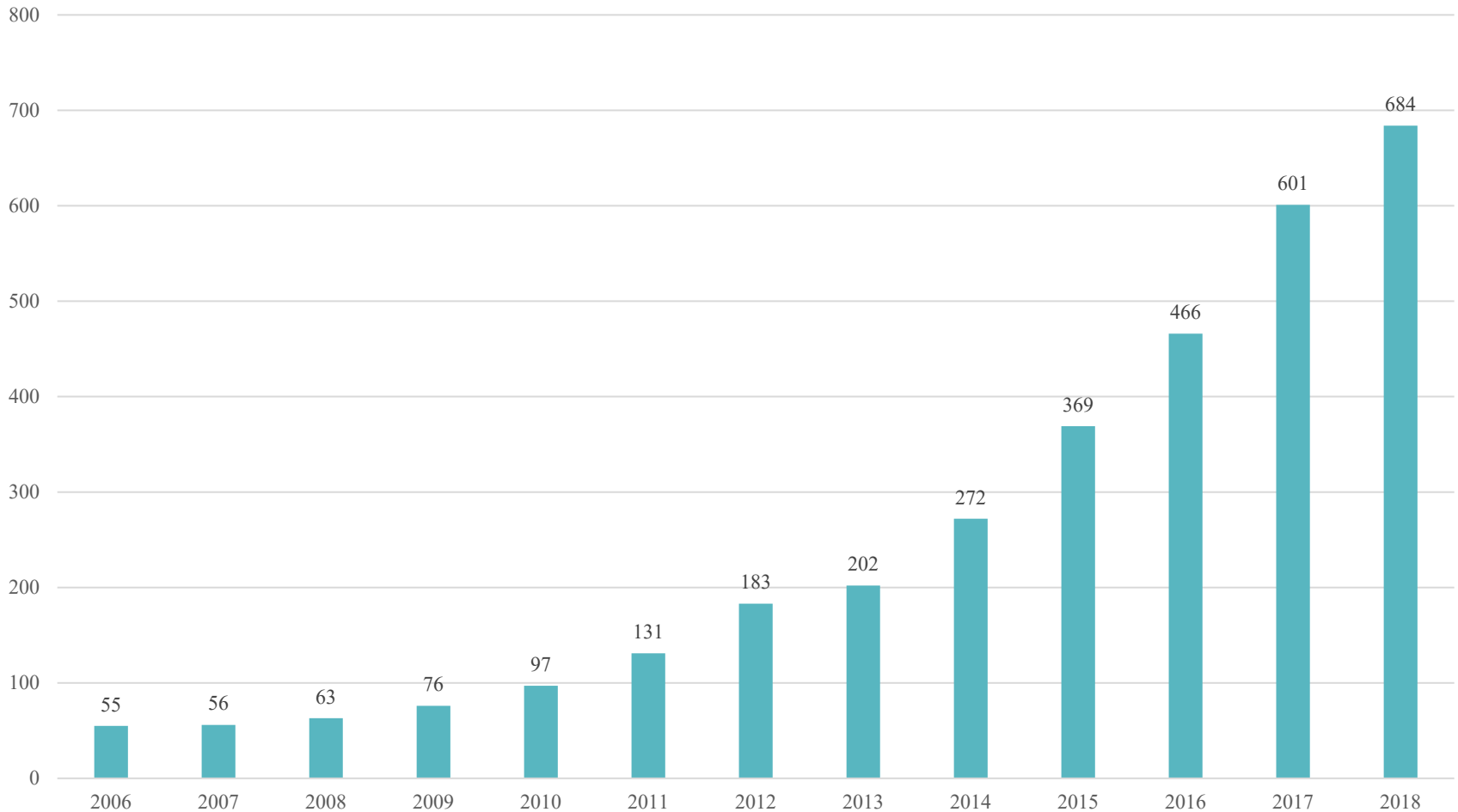
- Better cycling facilities
- Traffic calming of residential neighborhoods
- Mixed-use zoning and improved urban design
- Integration of bike with public transport
- Restrictions on motor vehicle use
- Improved traffic education for motorists and cyclists
- Traffic regulations and enforcement
- Special events and promotional campaigns

Better bike infrastructure improves cyclist safety and increases cycling

■ % Growth km of Cycling Facilities ■ % Growth in Cycling ■ % Change in Fatalities and Severe Injuries Relative to Cycling Levels



Growth in protected bike lanes in the USA, 2006-2018



Source: Furth. Ch. 5, in Buehler & Pucher (2021). [Cycling for Sustainable Cities](#). MIT Press.



Copenhagen



Bogotá

Protected bike lanes increase cycling and safety



Montreal



Sevilla,
Spain

Before



After



Planters for separation from MVs

Transformation of Hornby Street in Vancouver with installation of cycle track (protected bike lane)

Bike lanes on Sherbourne Rd in Toronto



Regular bike lane in other direction

Raised bike lane with curb between cyclists and motor vehicles



Networks of protected bike lanes have increased cycling by children and women in Sydney and Brisbane, Australia

Photos: Fiona Campbell

Bicycle Expressways

Freiburg, Germany



Germany



Dortmund,
Germany



Beijing, China



Important
new trend
in many
countries



Source: Jack Todd

Cherry Creek Trail, Denver (15 miles)



Midtown Greenway, Minneapolis (6 miles)



Source: David Loutzenheiser

Minuteman Trail, Boston (10 miles)

Greenways that also serve long-distance cycling for daily commutes



Santa Barbara coastal path: Safe and attractive both for cyclists and pedestrians

Conversion of two car lanes to bike path and walkway

Source: Ralph Fertig

Lakefront Trail is 18 miles long with more than 100,000 users on typical summer weekends

Greenways that also serve long-distance cycling for daily commutes



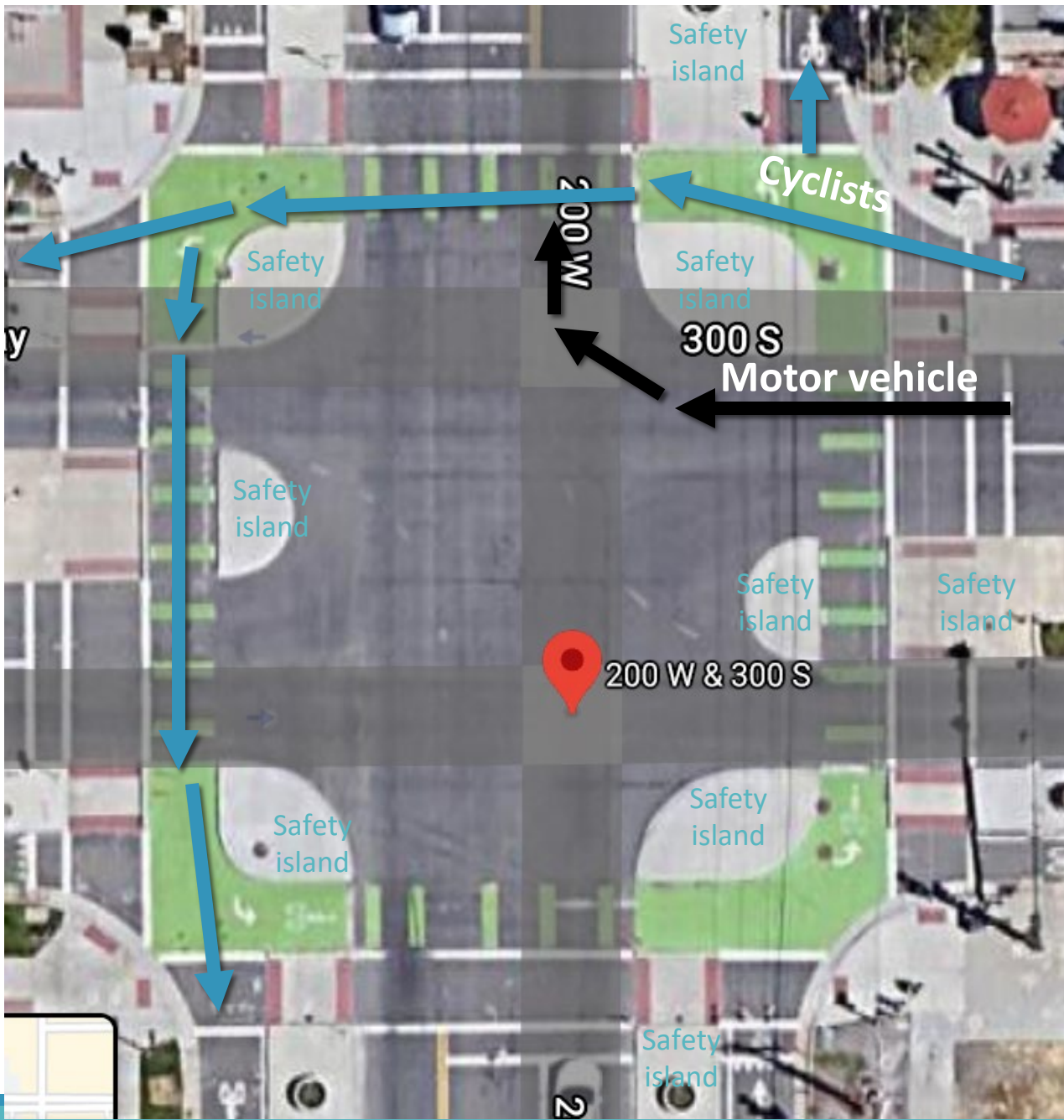


New flyover connects north and south segments of Lakefront Trail avoiding congested intersections at Grand and Illinois Avenues



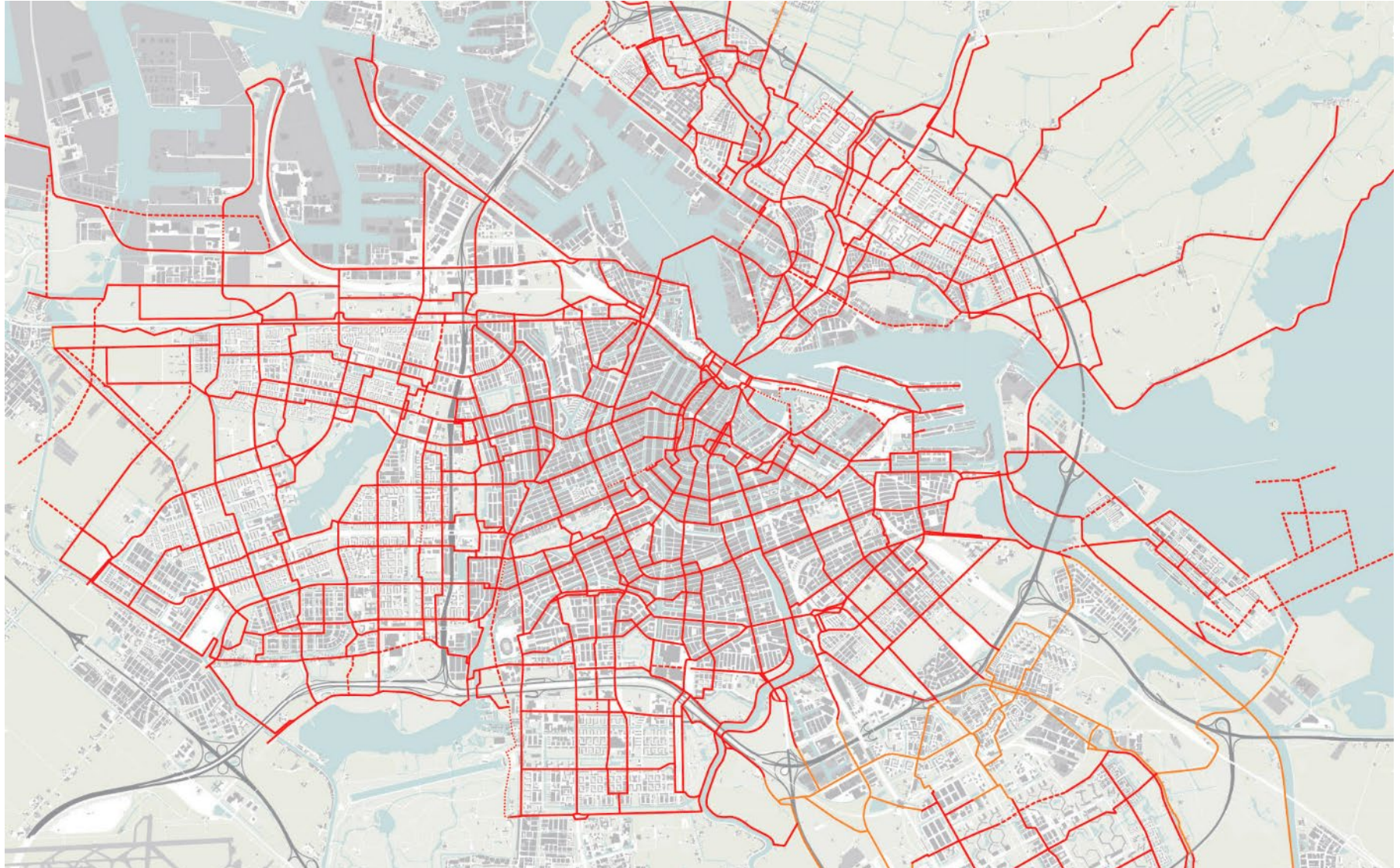
**Convenient bikeway underpass
at UC Santa Barbara**

Photo: Ralph Fertig



Dutch-Style Protected Intersection in Salt Lake City, 2015

Photo: Google Maps Satellite View



Bike paths and lanes in Amsterdam: A truly connected network

Credit: City of Amsterdam

1971

Amsterdam

2020



1971

Amsterdam Archives

2020

[schlijper.nl](https://www.schlijper.nl)
today

Source: Thomas Schlijper, Twitter

1953

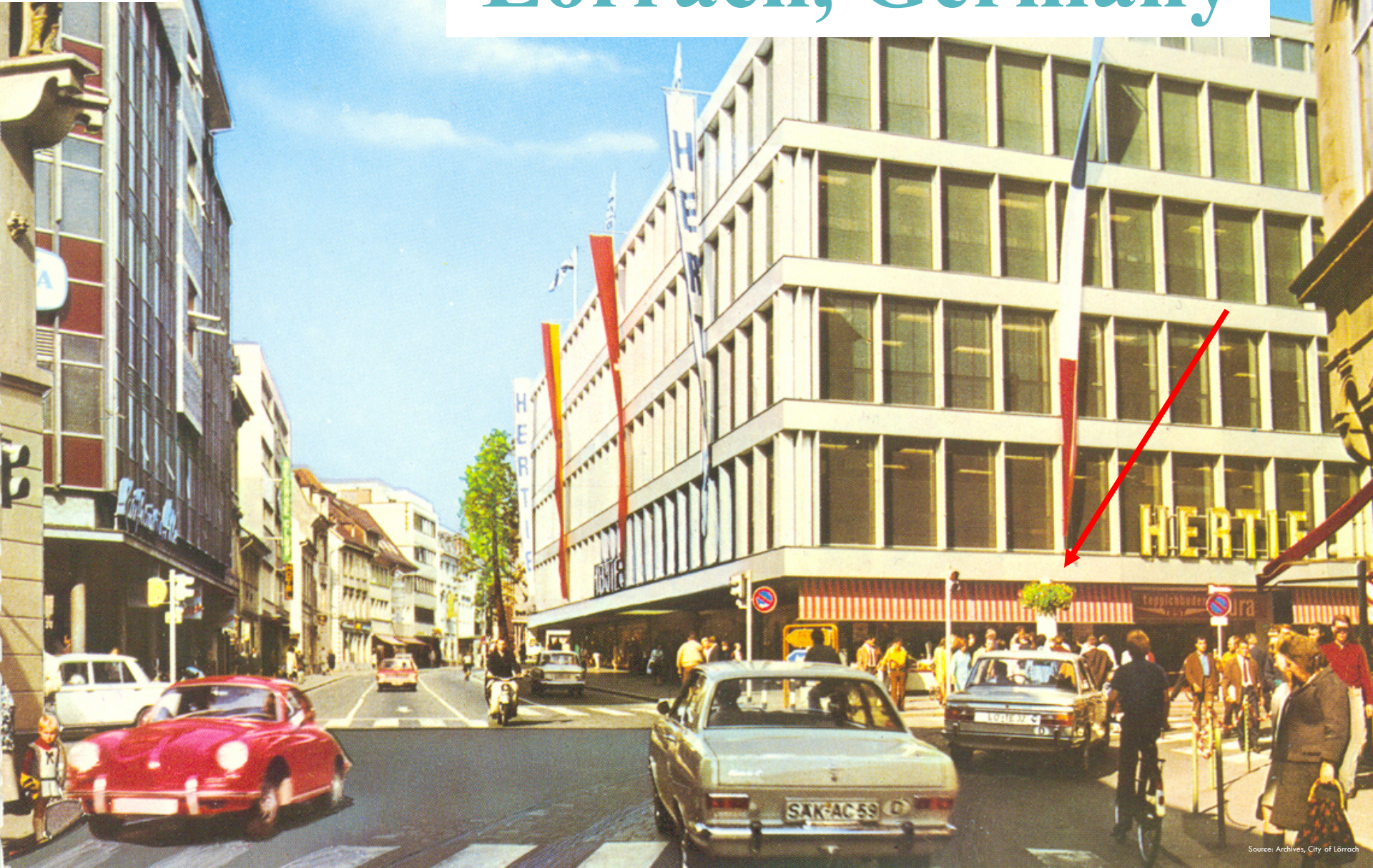
Lörrach, Germany



Source: Archives, City of Lörrach

1972

Lörrach, Germany



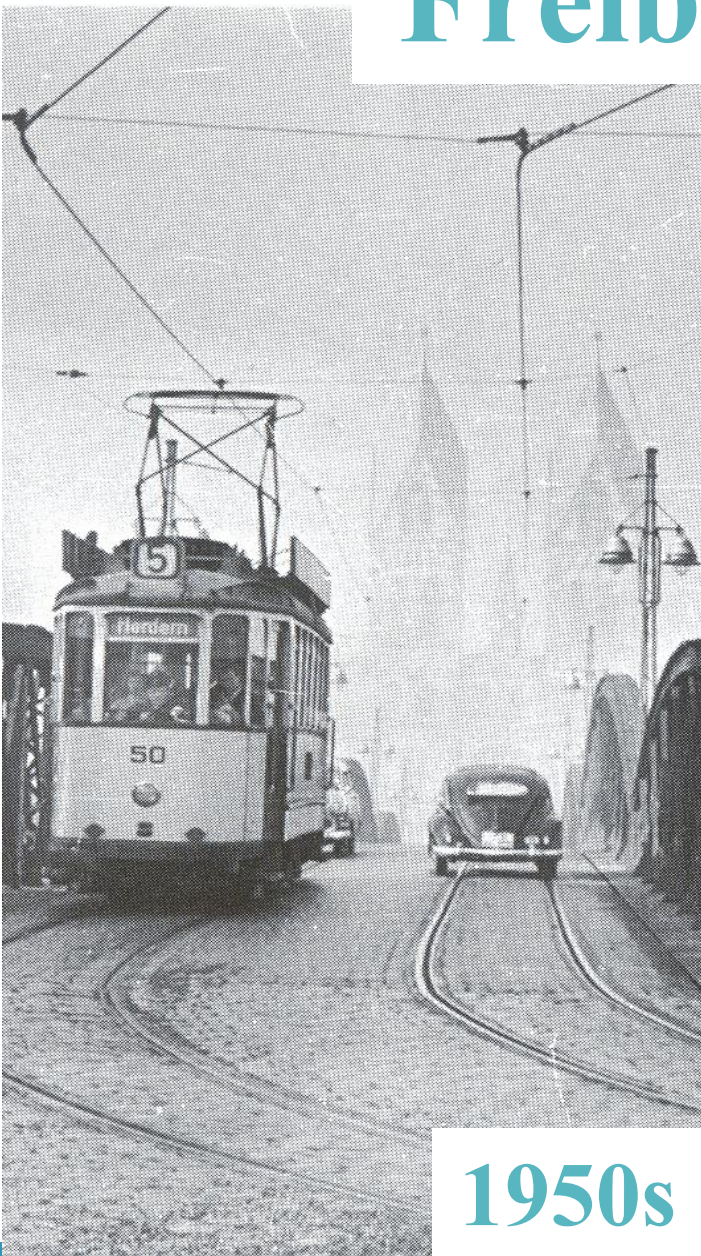
Source: Archives, City of Lörrach

2018

Lörrach, Germany



Freiburg, Germany



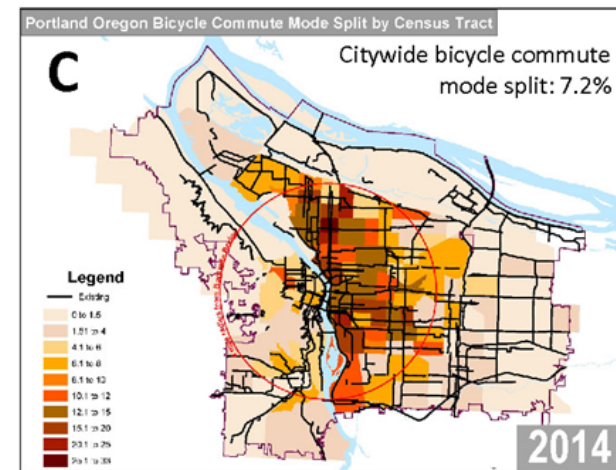
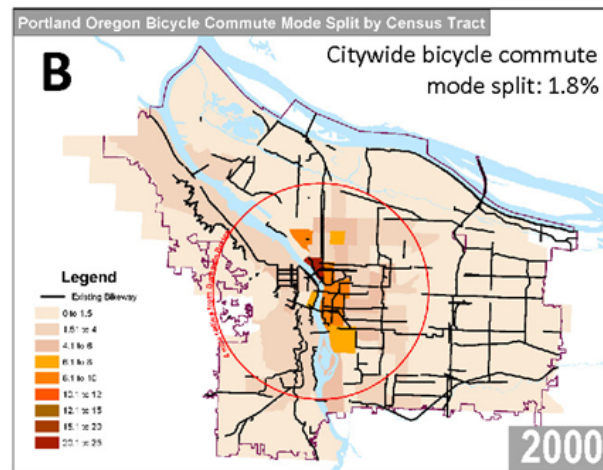
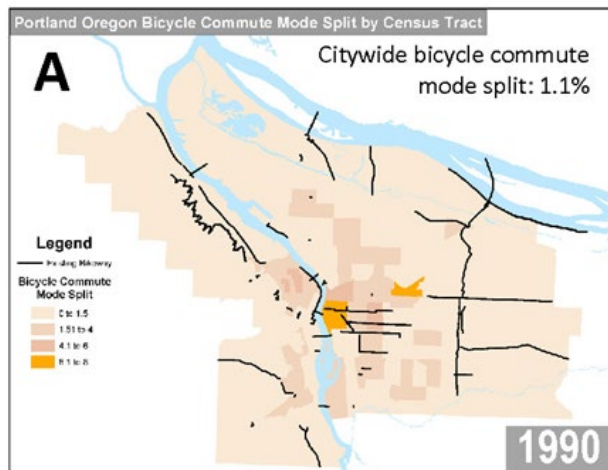
1950s



1960s



Today

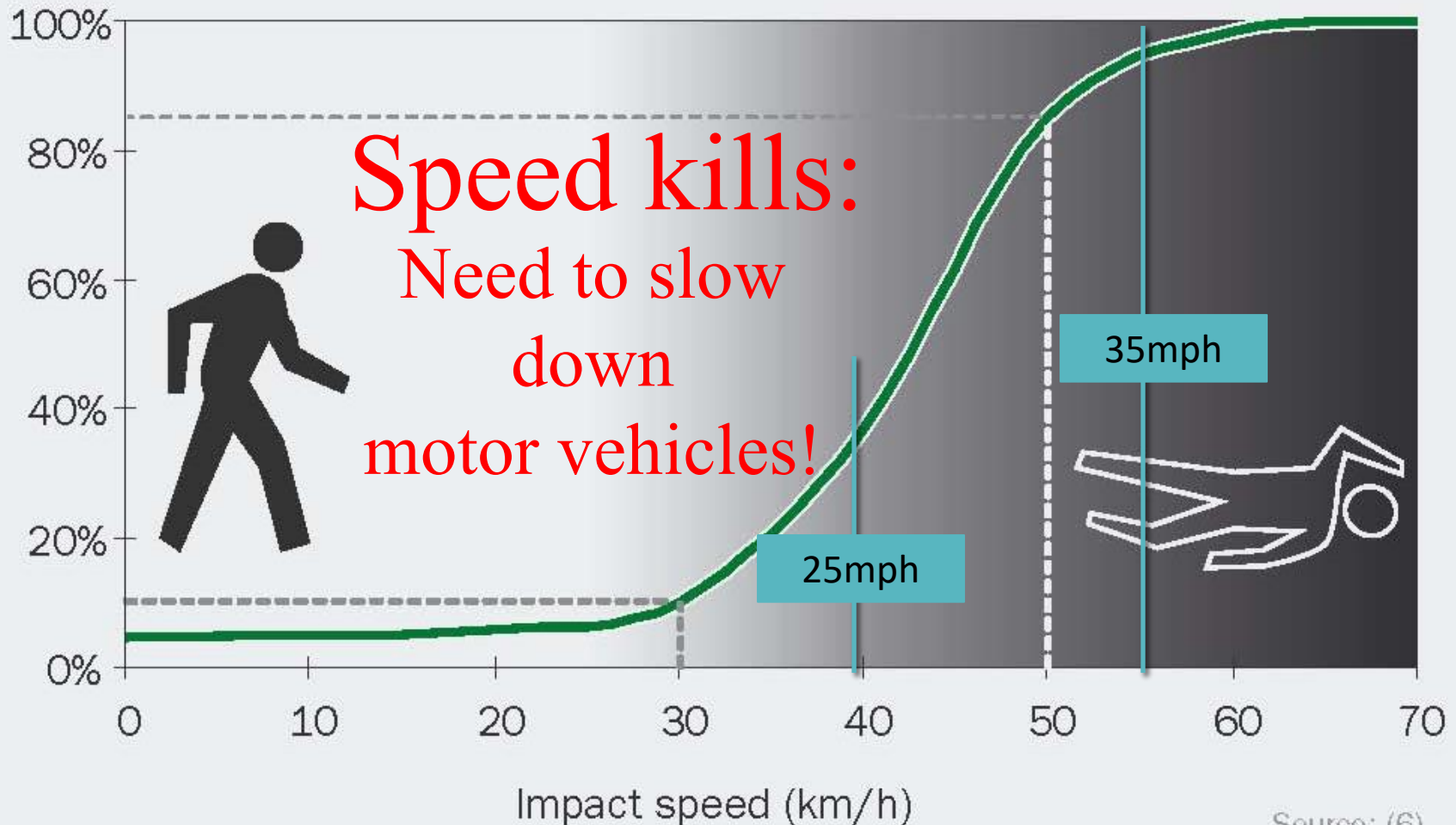


Expansion of Cycling Facilities into a Connected Network Increased Cycling and Improved Safety in Portland (above) and Sevilla (below)



Traffic Calming Saves Lives

Figure 1.1 Probability of fatal injury for a pedestrian colliding with a vehicle



Source: (6)

- 30km/h speed limit
- Area-wide, not just isolated streets
- Street narrowing at both ends



Typical in German and Dutch cities
(50%-80% of residential streets)



Traffic Calming in London

Examples from Montreal and Quebec City



Traffic diverters to prevent thru MV traffic, with cut-throughs for cyclists; one-way streets for MVs, 2-way for cyclists



Melbourne, Australia

“Artificial dead-ends” for motorists,
but cut-throughs for cyclists



Riding to school through a slow point on one of six Safe Active Streets that give cyclists priority in Perth, Australia



Similar road narrowing infrastructure along the entire street

Speed limit: 30km/h

Source: Active Transportation Alliance

Combines various types of cycling infrastructure with traffic calmed streets



20mph=30km/h
typical traffic calming speed in Europe

Contra-flow bike lane

Sharroved lane in other direction

On-street neighborhood greenways (bike boulevards) are especially useful for daily travel within cities





Typical Shared Streets in German suburbs (5-7km/hr speed limit)

- Motorists share streets with cyclists, pedestrians, and playing children
- No separate infrastructure for cyclists or pedestrians



Photo: Peter Berkeley

Pedestrians, cyclists, and cars share a major shopping street in Vienna, Austria





Washington, DC

Bike Transit Integration and Bike Parking



Freiburg

Groningen



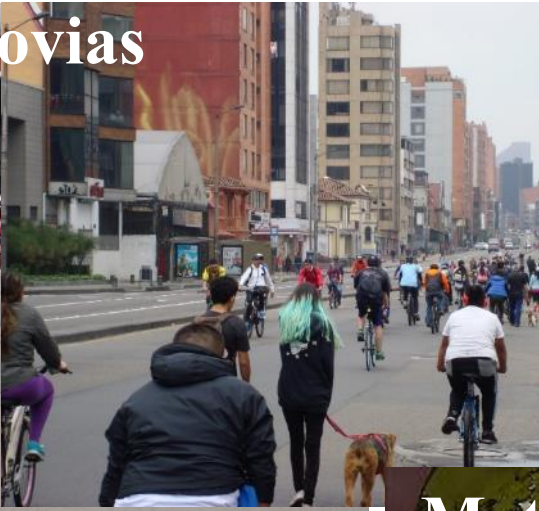
Vancouver

Portland

Nagoya, JP

Cycling promotion and training

Ciclovias



Bike to school day



Bike training for children



Bike sharing



Bike-to-work day



Motorist training



Benchmarking



Bike training for adults

Implementation Strategies

- Publicize both individual and societal benefits
- Ensure citizen participation at all stages of planning and implementation
- Implement controversial policies in stages
- Develop long-range bike plans and regularly update them
- Combine incentives for cycling and disincentives for car use
- Build alliances with politicians and sustainability advocates
- Integrated national, state, and local bike advocacy
- Benchmarking to measure success over time

Summary Lessons

- Crucial importance of safe cycling infrastructure
- Need for an integrated package of programs and policies to complement bikeways
 - Parking; land-use; traffic calming; enforcement; education; integration with transit; wayfinding → push factors for drivers; pull factors for bikes
- Cycling for everyone: the importance of equity
 - Infrastructure for all & inclusive cycling cultures
 - Planning process must prioritize the inclusion of vulnerable, risk-averse, & disadvantaged groups at every stage

How to make
city cycling
safe and
convenient
for everyone

MIT Press,
464 pp, AUS \$55
(Booktopia, Amazon)

Cycling for Sustainable Cities



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and **John Pucher**

Questions?



John Pucher



Ralph Buehler

CYCLING FOR SUSTAINABLE CITIES COMMUNITY OF PRACTICE (COP)



Expressions of Interest are open to join the CWANZ *Cycling for Sustainable Cities* Community of Practice

To submit an EOI please visit here: <https://forms.gle/Qx96EeZjQpjLx7DT6>

For further information contact Sam Bolton eo@cwanz.com.au

EOIs close COB Friday 29 October 2021

First meeting Wednesday 29 November 2021 via MS Teams

Upcoming Austroads webinars

Topic	Date
New Pathway for the Implementation of Nationally Harmonised Temporary Traffic Management Practice	26 October 2021
Strategic Review of the Guide to Traffic Management	11 November 2021

Register at austroads.com.au/webinars-and-events

Thank you for participating!

Watch our webinar recordings when and where it suits you!

There are more than 100 to choose from at **austroads.com.au/webinars**