

PBIC Webinar

What the U.S. can learn from international efforts to improve pedestrian and bicycle safety



Hana Maier, [Federal Highway Administration](#)

Libby Thomas, [UNC Highway Safety Research Center](#)

Conor Semler, [Kittelson & Assoc.](#)

Dan Goodman, [Federal Highway Administration](#)

Gabe Rousseau, [Federal Highway Administration](#)

March 24, 2 pm



Pedestrian and Bicycle
Information Center



Today's Presentation

- ⇒ **Introduction and housekeeping**
- ⇒ **Presentations**
- ⇒ **Questions at the end**



Webinar Issues

⇒ **Audio issues?**

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⇒ **Webinar issues?**

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⇒ **Questions?**

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CM Credits

⇒ Certificate of Attendance

You will receive a certificate of attendance by email from the UNC Highway Safety Research Center



Pedestrian and Bicycle Information Center

Dear James,

Thank you for registering for "A Resident's Guide for Creating Safer Communities for Walking and Biking".

The Federal Highway Administration just released "A Resident's Guide for Creating Safer Communities for Walking and Bicycling," a free guide offering step-by-step instructions for residents and community groups looking to improve pedestrian and bicyclist safety, access, and comfort. This webinar offers an overview of the guide and will review how two communities used the principles outlined within it to make their communities more walkable and bikeable.

Tamara Redmon, with FHWA's Office of Safety, will introduce the guide and discuss how it fits within the US Department of Transportation's Safer People, Safer Streets Initiative.

Laura Sandt, with the Pedestrian and Bicycle Information Center, will discuss the content of the new guide and how residents can use it.



PBIC News and Announcements

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FHWA Global Benchmarking Program

Global Benchmarking Program



- Provides a dedicated mechanism for obtaining and adapting proven foreign innovations that can help FHWA respond to challenges facing the U.S. highway system
- Connects FHWA technical experts, either directly or indirectly, with transportation advances around the world and with the people involved in applying them
- Distinguished from other FHWA international interactions by its more unilateral agenda and structured implementation support

Program Goal:

Avoid duplicative research, reduce overall costs, and accelerate improvements to our transportation system

Program Methodology



The Global Benchmarking Program features a strategic and flexible methodology that takes into account the challenges of limited resources.

Key features of this approach include:

- Strategic selection of study topics
- Emphasis on front-end information collection
- Use of virtual exchange
- Limited/tactical use of foreign travel
- Effective and timely communication of findings
- Focus on implementation

PBIC Webinar

Delivering Safe, Comfortable, and Connected Pedestrian and Bicycle Networks: A Review of International Practices

Libby Thomas, University of North Carolina Highway Safety
Research Center
Conor Semler, Kittelson and Associates, Inc.



Pedestrian and Bicycle
Information Center



Delivering Safe, Comfortable, and Connected Pedestrian and Bicycle Networks: A Review of International Practices



Project Team

HSRC: Dan Gelinne, Patty Harrison, Kate Hill, James Gallagher, Nathan Thirsk, Laura Sandt, Libby Thomas, Charles Zegeer

Kittelson and Associates: Paul Ryus, Conor Semler

Kevin Krizek, U. of Colorado Boulder

FHWA Technical Panel

Christopher Douwes, mgr.
Dan Goodman
Hana Maier
Gabe Rousseau

Delivering Safe, Comfortable, and Connected Pedestrian and Bicycle Networks: A Review of International Practices

- Introduction and Study Objectives
- Study Approach
- Key Study Findings
 - Network Infrastructure – Designs and Operations
 - Project Prioritization Practices
 - Performance Measurement



Intro. & Study Objectives

- Prior studies
- Identify noteworthy and innovative international designs, treatments, and other practices that could be used to improve bicycle and pedestrian safety and complete networks in the U.S.



Study Approach

- Desk survey of practices
 - Literature search and review
 - International jurisdictions and research websites
 - Internet survey of international jurisdiction
 - Phone interviews
- Criteria for highlighted practices



General Topics

- How jurisdictions determine what is a complete and safe network
- What performance measures are used
- What methods are used to identify safety problems or gaps in networks
- What measures or criteria are used to prioritize improvements
- What innovative treatments have been used to address safety problems or other gaps



Criteria for Inclusion of Innovation

- Not identified in prior reviews, innovative
- 3 main criteria for selecting and highlighting treatments/ideas that may merit further study in the U.S.:
 - Consistent with one or more FHWA's goals and objectives
 - Evidence of potential benefits or effectiveness
 - High apparent potential for use in the U.S.



Study Findings

- Infrastructure Practices (designs, ops., ITS, policies)
- Prioritization
- Performance Measurement
- Conclusions



Infrastructure Practices

- 1) Bicycle network improvements
- 2) Limited auto traffic areas or pedestrian priority zones
- 3) Signalization, traffic control and intelligent transport systems (Traffic management/operations)



Infrastructure:

Priority Bicycle Streets

- Autos allowed; bicycle priority
- Low auto traffic volumes; high bike volumes
- Low speed; shared roadway



Bicycle Street, Næstved,
Denmark (Source: Paul Ryus)

Infrastructure:

Priority Bicycle Streets



One-lane and
in different Netherlands cities.



Two-lane Bicycle Streets
(Source: Rick Delbressine)

Infrastructure:

Bicycle “Superhighways”

- Intended to support longer trips (> 5 km, or 3 mi), higher speeds, fewer stops
- Space to themselves, often within the roadway right-of-way
- Over/Underpasses may be used to bypass junctions or other



“Cykelslangen” Bicycle Bridge
Copenhagen, Denmark

Source: Paul Ryus, KAI

Infrastructure:

Other Designs

- LED lane **lighting**/ path **lighting**
 - Light/motion sensitive
 - Solar powered
- Set-back motorist stop bar relative to bike stop bar at intersections



Starry Night path, Eindhoven, ND
(Source: CNN)



Set-Back Stop Bar, Odense, Denmark. (Source: Geske Bak)

Infrastructure:

Grade-Separated Path Junction



Shared Use Path Grade Separations, Haderslev, Denmark
(Source: 2015 Google et al.)

Infrastructure:

C-Roundabout - Experimental

- Cyclist-friendly design for multi-lane roundabouts
 - Narrow approaches to reduce entering/exiting speeds
 - Large vehicles “take the lane”
 - Trials in Auckland, NZ



C-Roundabout. (Source: © Google, 2015. Image, 2012)

Infrastructure:

Traffic Management and Operations

- Green wave – progressive signal timing – bicycle speed
- Green LED lane lights – indicates cyclists will have sufficient time to clear intersection
- Bicycle “free right turn” / right turn “bypass”
- Bicycle Stop-exemption at top of T-intersections for thru movement



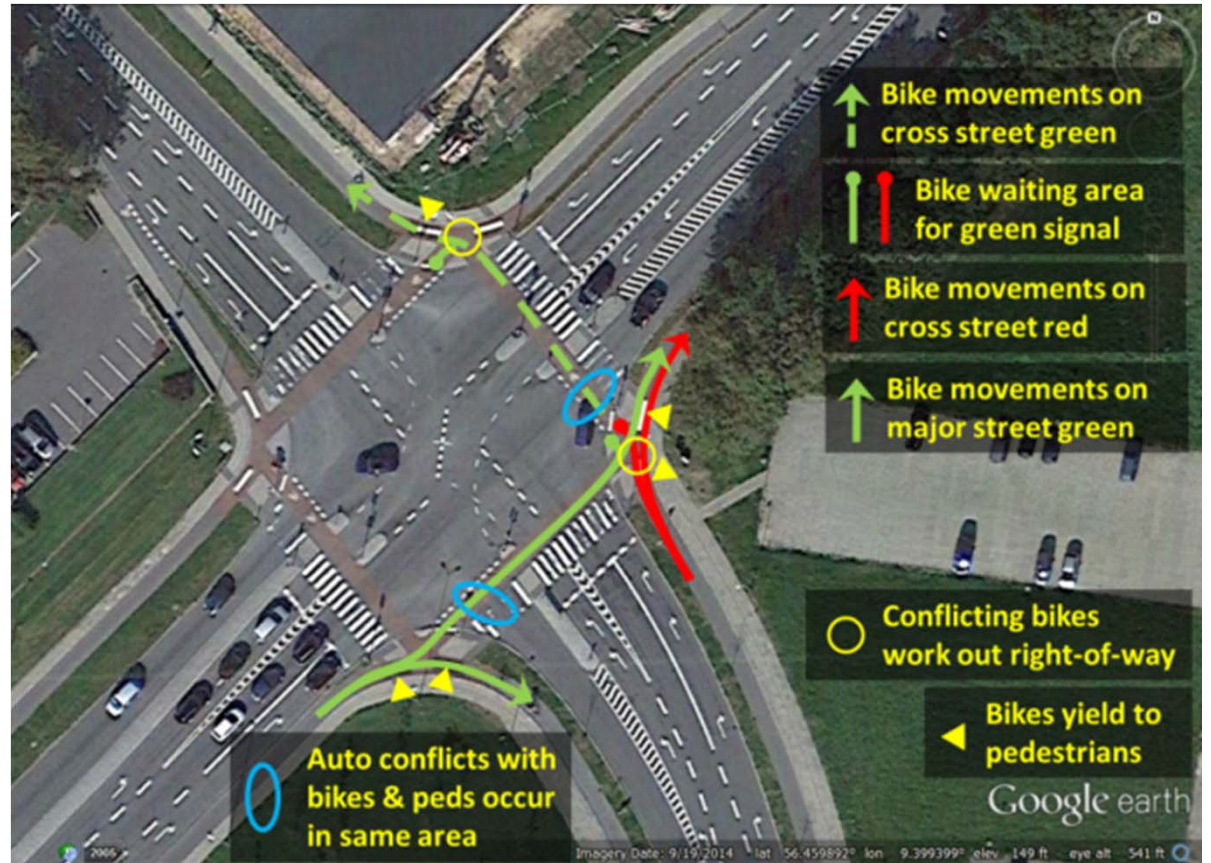
Infrastructure:

Traffic Management and Operations – Green Wave

- *“Stockholm now has its own 9 km-long ‘Green Wave,’ which allows bicyclists in one direction to travel this distance (if they ride at 18 km/hr) without putting their foot down for a stop light.”*
- 15,000 cyclists per day
- “Signature project”
- Removed a lane of auto traffic
- More pedestrian space
- Widened bike lanes

Infrastructure:

Bicycle Free Right-Turn/Advanced Bike Stop Bar Design



Viborg, Denmark. (Source: © 2015 Google)

Infrastructure:

Traffic Management and Operations

- Feedback to pedestrians on estimated waiting time at signals
- Providing more green time for pedestrians at signal-controlled junctions



Traffic Management

- Limited auto traffic areas
 - Urban cores – *Bologna, Ferrara, Florence, IT* (vars. in size and restrictions such as residents only, taxis to hotels, and/or freight at very low speed only)
 - University areas – *Toronto, Ont, CA*
 - Time of day – *Tokyo, JP*



Innovative Policies

- Design decisions are governed by policies
- Innovative policies enable new practices
- Updated policies shift priorities from autos to pedestrians and bicyclists



Innovative Policies

- Policies deliberately and explicitly prioritize pedestrians and bicycles
- Tangible steps to help achieve mobility goals



Connectivity

- Alberta Province



Prioritization

- Project funding mechanisms prioritize investments in walking and biking
- Thoughtful consideration of priorities to identify projects
- Planners and engineers routinely cycle on their streets



Prioritization

- Example Criteria (Copenhagen, Denmark)
 - Number of bicyclists (>5,000 daily bikes demand separated bike lane)
 - Crashes
 - Comfort
 - Connectivity of bike network
 - Need for contraflow travel
 - Connection with other projects

Prioritization

- Fredericia Municipality, Denmark



Source: Wayne Feiden

Prioritization

- National Priorities
 - **Finland:** national guidelines for cost-benefit analysis
 - Detailed guidance on socio-economic impacts
 - **Japan:** significant commitment to reducing crashes governs prioritization
 - **Sweden:** pedestrian and bicycle commute prediction tool

Performance Measurement

- Support complete pedestrian and bicycle networks
- Leading cities have strong performance measures
- Consider environmental, sustainability, economic, and public health goals



Performance Measurement

- Example measures (Copenhagen's annual bicycle account)
 - Average bicycle speed
 - Millions of bicycle trips per year
 - Commute mode split
 - Bicycling kilometers per day (and per capita)
 - Number of sick days reduced per year
 - Reduction in car trips and car kilometers traveled
 - Average bicycle trip length
 - Reduction in carbon dioxide emissions



Performance Measurement

- Amsterdam, The Netherlands
- Pedestrian accessibility assessed for every address
- Predict pedestrian volumes based on density and land use



Source: Dylan Passamore

Performance Measurement

- 's-Hertogenbosch, The Netherlands
 - Design standards for bicycle network
 - Route-level quality
 - Directness ratio
 - Intersections per km without bicycle priority
 - Turns per km along route
 - Wait time at traffic signals
 - Street-level facility design
 - Intersection level



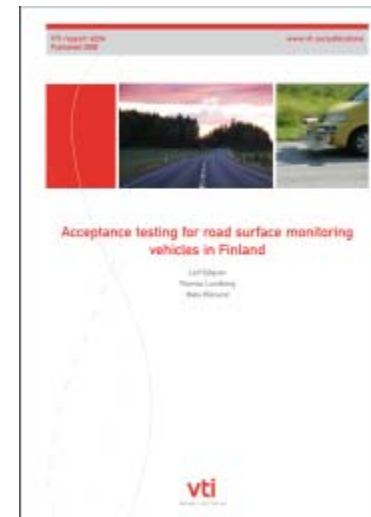
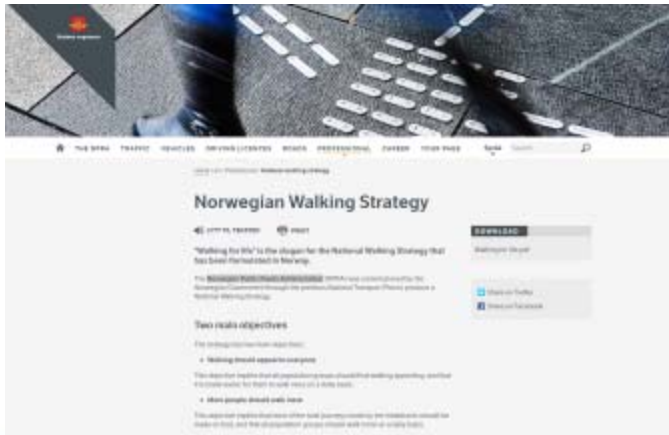
Performance Measurement

- LundaMaTs II – Lund, Sweden
 - Seven focus areas, including Pedestrian Traffic and Bicycle Traffic
 - Sets firm benchmarks
 1. Increase bike/ped network by 10% by 2013 and 30% by 2030
 2. Proportion of safe crossings will be 30% by 2013 and 100% by 2030
 3. Walking trips per resident will increase
 4. Cycling trips per resident will increase 5% by 2013 and 10% by 2030
 5. Bicycle/car travel time ratio for new developments will be less than 1.5 for travel to city and district centers
 6. Accessibility for the disabled, children and elderly will increase



Performance Measures

- National Performance Measures
- Norway's National Walking Strategy
- Finland VTI testing road surface evenness with laser sensors



Evaluating Outcomes

- Monitoring and measuring safety and operational impacts of treatments
- Continually develop solutions to identified problems



Evaluating Outcomes

- Safety Monitoring
 - The Netherlands tracking rise in bicycle crashes
 - Serious injury and single-bicycle crashes both increasing



Evaluating Outcomes

- Innovative Treatments Evaluations
- How well might these treatments work in the U.S.?



Evaluating Outcomes

- Bicycle Superhighway (Copenhagen)
 - Significant bicycle volume increase
 - 10 percent of new users shifted modes
 - Travel time unchanged
- Priority Bicycle Streets (Netherlands)
 - Little consistency between facilities



Evaluating Outcomes

- C-Roundabout (Auckland)
 - Reductions in entering, existing, circulating speeds
 - Inconclusive crash results
- Danish Intersection Controls
 - Bicycle right turns without stopping on red
 - Right-turn bypass for bikes
 - Exempting through bikes along the top of a T
 - Left-turning bikes also proceed across the T and then observe a left-turn bicycle signal

Evaluating Outcomes

- Effects of Infrastructure on Mobility
 - Quiet Lanes (UK)
 - Little change in travel behavior, yet strong support
 - Greenways (Girona, Spain)
 - Significant impact on residential travel behavior, less for tourists
 - Largest impacts on recreational use



Key Take Aways

- Building on prior ideas/successes to expand networks
- Biking and walking are high priorities and goals reflect that
- National priorities and support for sustainable safety/Vision Zero
- Significant local autonomy in decision-making
- Value for public opinion in prioritizing
- Staff expertise, networking, peer exchange all support innovation – testing new ideas



Discussion

- Thank you!
- Report link:
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/global_benchmarking/page01.cfm





Bicycle Network Planning & Facility Design Approaches *in the Netherlands and the United States*

FHWA Global Benchmarking Program



U.S. Department of Transportation
Federal Highway Administration

Questions?

- ⇒ **Archive at www.pedbikeinfo.org/webinars**
Download a video recording and presentation slides
- ⇒ **Questions?**
 - **Hana Maier**
hana.maier@dot.gov
 - **Libby Thomas**
libbyt@email.unc.edu
 - **Conor Semler**
csemler@kittelsohn.com

