2-27-2019

Webinar: Rethinking Streets for Bikes: An Evidence Based Guide of Bike-Friendly Street Retrofits

Marc Schlossberg  
University of Oregon

Roger Lindgren  
Oregon Institute of Technology

Let us know how access to this document benefits you.

Follow this and additional works at: https://pdxscholar.library.pdx.edu/trec_webinar

Part of the Transportation Commons, Transportation Engineering Commons, Urban Studies Commons, and the Urban Studies and Planning Commons

Recommended Citation

https://pdxscholar.library.pdx.edu/trec_webinar/35

This Book is brought to you for free and open access. It has been accepted for inclusion in TREC Webinar Series by an authorized administrator of PDXScholar. For more information, please contact pdxscholar@pdx.edu.
Rethinking Streets for Bikes: An Evidence Based Guide of Bike-Friendly Street Retrofits
February 27, 2019

NATIONAL INSTITUTE FOR TRANSPORTATION & COMMUNITIES
UPCOMING EVENTS

March 8, 2019
Public Transportation and New Mobility
Chris Pangilinan, Uber

Friday Transportation Seminar Series
Available to watch online. Full schedule is available online as well.

March 21, 2019
Webinar: E-Bikes for Everyone: Electrifying Communities in New Ways
John MacArthur, TREC
Sergio Lopez, Forth
trec.pdx.edu/events
The webinar recording and slides will be posted online, and a link will be sent out to attendees.

The webinar has been approved for 1 CM and PDH

After the presentation we’ll have 15 minutes for questions:

Type your questions here!
RETHINKING STREETS FOR BIKES
An Evidence-Based Guide to 25 Bike-Focused Street Transformations

Marc Schlossberg, PhD
Roger Lindgren, PE, PhD
Dave Amos, AICP
John Rowell, AIA
RETHINKING STREETS
THE ORIGINAL - 2015

'Normal’ complete street retrofits

Engineers / planners / policy makers / urban designers / community members

Nearly 5,000 copies (print/PDF)
RETHINKING STREETS FOR BIKES
THE SEQUEL - 2019

RETHINKING STREETS FOR BIKES
An Evidence-Based Guide to 25 Bike-Focused Street Transformations

Marc Schlossberg, PhD
Roger Lindgren, PE, PhD
Dave Amos, AICP
John Rowell, AIA
OUR PURPOSE

- Show evidence that the world won’t end when building great bike systems; many things improve
  - Economy, equity, environment, happiness
- Lower the risk for communities everywhere
- Empower non-engineers
- Empower traffic engineers
BUILDING CITIES FOR PEOPLE ON BIKE
Advisory Bike Lanes (ABLs)
Cycle Tracks (two-way)
Protected Bike Lanes (one-way)
Protected Intersections
Raised Facilities
Small Investments
Off-Street paths
And more.....
One-way protected bike lanes through Downtown Oakland increases safety for all users.

- In 2016, the City of Oakland removed one travel lane in each direction on Telegraph Avenue between 18th Street and 44th Street to create space for cyclist and pedestrian safety improvements.
- Low-cost parking-protected bicycle lanes serve as an interim solution while the City seeks funding for future capital improvements along the corridor.

Key Outcomes
Safe and attractive for all users. Not only has the previously “high injury” corridor seen a decrease in the crash rate, but the narrowed vehicle right-of-way has reduced speeding and increased overall corridor safety.

Building Neighborhood Vitality
As part of a phased complete streets plan, bicycle and pedestrian traffic have almost doubled since implementation of the first redesigns. This may have helped boost retail sales in the adjacent NODA district, which have increased since the installation of the protected bike lanes.

Telegraph Avenue Context
- Telegraph Avenue is an important corridor between the neighborhoods of northern Oakland and downtown and is a major connector to the City of Berkeley and its university. Prior to installing the bike lanes, there were two lanes of car traffic running in both directions and no dedicated facilities for cyclists.

- The ongoing Telegraph Avenue Complete Streets Implementation Plan works to balance the needs of all users and has set metrics to evaluate the project’s impact on safety, economic vitality, and user satisfaction. In addition to protected bike lanes, the City has installed pedestrian improvements (median refuge islands, ladder crosswalks, and curb extensions) and relocated bus stops to improve efficiency of bus transit operations.

- Based on their project progress report, which included deliberations around safety, the City identified steps to improve visibility with new barriers and street paint. Without these additional buffers, many vehicles were parking in near buffer zones, significantly increasing monthly parking citations.

- Since installing the project, the City has seen a significant decrease in speeding. Fifty-two percent of bicyclists say they now travel through the corridor more frequently.

Aerial view of Telegraph Avenue.

New City of Oakland bike share program riders on protected bike lanes.

Low-cost planters provided a demonstration of the future project during early project outreach.

Protected bike lanes increased ridership and accessibility on this busy downtown corridor.
How to Use This Guide

OAKLAND, CALIFORNIA
Metro pop: 4,305,901 | City pop: 420,005

Telegraph Avenue

Key Interventions

One-way protected bike lanes through Downtown Oakland increases safety for all users.

- In 2016, the City of Oakland removed one travel lane in each direction on Telegraph Avenue between 19th Street and 41st Street to create space for cyclist and pedestrian safety improvements.
- Low-cost parking-protected bicycle lanes serve as an interim solution while the City seeks funding for future capital improvements along the corridor.

Before

After
ONE-WAY PROTECTED BIKE LANE

STREET CLASSIFICATION
Principal Arterial

RIGHT OF WAY
Varies

LENGTH
0.65 miles

SPEED
Before
25

After
25

AVERAGE DAILY TRAFFIC
13,900

RESPONSIBLE AGENCY
City of Oakland

Key Outcomes
Safe and Attractive for all Users
Not only has the previously "high-injury" corridor seen a decrease in the crash rate, but the narrowed vehicle right-of-way has reduced speeding and increased overall corridor safety.

Building Neighborhood Vitality
As part of a phased complete streets plan, bicycle and pedestrian traffic have almost doubled since implementation of the first redesigns. This may have helped boost retail sales in the adjacent KONO district, which have increased since the installation of the protected bike lanes.

Evidence of Change

Facts and Figures

Street Section Before and After
How to Use This Guide

Additional Information on the Street and its Context

Telegraph Avenue Context

- Telegraph Avenue is an important corridor between the neighborhoods of northern Oakland and downtown and is a major connector to the City of Berkeley and its university. Prior to installing the bike lanes, there were two lanes of car traffic running in both directions and no dedicated facilities for cyclists.
- The ongoing Telegraph Avenue Complete Streets Implementation Plan seeks to balance the needs of all users and has set metrics to evaluate the project’s impact on safety, economic vitality, and user satisfaction. In addition to protected bike lanes, the City also installed pedestrian improvements (median refuge islands, ladder crosswalks, and curb extensions) and relocated bus stops to improve efficiency of bus transit operations.
- Based on their project progress report, which included deliberate community outreach, the City identified steps to improve visibility with new bollards and street paint. Without these additional buffers, many vehicles were parking in unclear buffer zones, significantly increasing monthly parking citations.
- Since installing the project, the City has seen a significant decrease in speeding.
- Fifty-two percent of bicyclists say they now travel through the corridor more frequently.

Map of the Street and the Surrounding Area

Location and Median Income

OAKLAND, CALIFORNIA
City Median Household Income: $57,778
ONE-WAY PROTECTED BIKE LANE

Aerial view of Telegraph Avenue. Source: City of Oakland

New City of Oakland bike share program riders on protected bike lanes. Source: City of Oakland

Low-cost planters provided a demonstration of the future project during early project outreach. Source: City of Oakland

Protected bike lanes increased ridership and accessibility on this busy downtown corridor. Source: City of Oakland
Changing the Framing of Our Streets

ADT vs. ADT for All
Average Daily Traffic (ADT) is a common measurement of the number of vehicles that travel on a road per day. This number leads to recommendations on how many lanes or space on the street should exist to handle the vehicles. ADT counts cars and thus results in allocating space for cars, not people. ADT calculations almost never count pedestrians, cyclists, or transit users, so the count itself leads to self-fulfilling policy decisions and investments.

Plan for the Peak vs. Plan for the Off-Peak
In the traditional framing, rush hour level of vehicle use guides most street allocation decisions. Yet in many cities, the rush hour may be little more than one to two hours per day and non-existent on weekends. This paradigm produces streets vastly and wastefully overbuilt for traffic 90 percent of the day. These overbuilt streets are then unwelcoming for cyclists and pedestrians. Alternatively, how might streets be designed if the peak were thought of as the hours when kids are walking to or from school rather than adults commuting to or from work?

Journey to Work vs. All Trips
Streets are generally designed to maximize throughput for one kind of trip: the commute to work. This ignores many of the trips we make, such as to run errands, see friends, or meet at a cafe or bar. About 40 percent of these trips are under two miles in length. Yet, even though these shorter, non-work trips are more common, streets are not designed for walking, cycling or scootering, perfect modes for these short trips.

When the paradigm shifts from vehicle delay to person delay, priorities shift to alternate modes such as cycling and mass transit.
Myths about Cycling

MYTH: Cyclists don’t pay their fair share because they don’t pay a gas tax or vehicle registration fee
FACT: Gas taxes and vehicle registrations only cover about half of the cost of road infrastructure. Other costs are covered through general taxes, property tax, and general bond measures—money everyone pays whether they drive or not. In addition to being one of the primary contributors to climate change, accidental death and injury, and other significant negative societal externalities, cars and trucks cause significantly more damage to our pavement than bikes.

MYTH: The safest thing a cyclist can do for safety is wear a helmet
FACT: The best thing that can be done to increase the safety of people on bike is to build connected systems of protected bikeways. The rate of cycling injuries and fatalities is significantly lower in global cities that have extensive networks of protected bikeways, where significantly more trips are taken on bike (over 35 percent of trips in some cities in Denmark and the Netherlands), and where helmet use is rare. Just like it is rare to bump into a fellow pedestrian in a way that results in serious injury, the same is true on bike when there is infrastructure that separates bikes from cars. Helmets do not cause harm, but they should not be the first focus for enhancing bicycle safety.

MYTH: Cycling in cities is bad for one’s health due to inhaling vehicle emissions
FACT: While it is true that cycling in car traffic does expose riders to increased air pollutants, the physical activity of cycling out-
The Changing Mobility Landscape

- How well will automated vehicles ‘see’ people on bikes?

- If automated vehicles are programmed to not hit people on bike (or foot), does that mean people on bike (or foot) can freely use the entirety of any street any time? Or will people on bike (and foot) be criminalized if ‘interfering’ with vehicles on the public street?

- Will a possible reduction in the need for on-street parking mean that street space will be allocated for better, protected bicycle infrastructure or something else?

- With increases in ridehailing services, will more vehicles be crossing bike lanes to drop off and pick up passengers or will curbs be systematically placed on the other side of bike lanes?

- Will automated transit become a reality? Will this increase transit/bike conflicts in mixed traffic environments?

- Does the rise of ridehailing and new space-efficient, microbility options like e-scooters, make it more likely that the future of transportation revolves around buying rides by mode depending on the trip need rather than buying vehicles?

Bicycles remain the most efficient human transportation invention and their positive qualities will appeal to new cyclists, especially as cities start implementing connected systems of low-stress bike infrastructure. With the quick rise in new forms of mobility, cities will need to make some quick decisions to help guide these technologies in complementary ways to the past investments in bicycle transportation already made.
Examples

RETHINKING STREETS FOR BIKES
An Evidence-Based Guide to 25 Bike-Focused Street Transformations

Marc Schlossberg, PhD
Roger Lindgren, PE, PhD
Dave Amos, AICP
John Rowell, AIA
Advisory bike lanes provide a safer commute for cyclists and pedestrians along rural streets in Hanover.

- Advisory bike lanes on the left and right sides of the road act as a safe zone while cars use a central, shared lane.

- The Town of Hanover’s pilot project demonstrated how a narrow street could have bike lanes.
Key Outcomes

Safer Streets
The primary goal of this project was to determine if advisory bike lanes increased safety for cyclists and pedestrians. Before the implementation of the bike lanes, 40 percent of vehicles were recorded going over the speed limit along Valley Road. Since the implementation, Hanover's police department has reported less speeding along this road. Community members say they “love them” and that the “lanes wake people up and slow them down.”

Increased Bike Network
The success of the pilot advisory bike lanes along Valley Road led to the decision to approve permanent advisory bike lanes along this road. This success has spurred the planning for additional advisory bike lanes throughout Hanover to create a more connected bicycle transportation system.

STREET CLASSIFICATION

Local Road

RIGHT OF WAY

20 feet

LENGTH

0.24 miles

SPEED

BEFORE

AFTER

25

25

AVG. DAILY TRAFFIC

N/A

N/A

RESPONSIBLE AGENCY

Town of Hanover
N Street

LINCOLN, NEBRASKA
Metro pop: 326,921 | City pop: 280,364

The state’s first cycle track bridges gaps in city’s bicycle access through a downtown corridor.

- In 2015, the City of Lincoln installed a curb-protected two-way cycle track between 23rd Street and Arena Drive that includes bioswale planter beds in some sections.

- Green paint clearly highlights the cycle track where it crosses intersections as well as turn boxes to provide an extra level of protection for cyclists.
Key Outcomes

Road Diet
The ample pre-existing right of way left significant room for the addition of the cycle-track whose wide buffer allowed for the inclusion of green bioswales and planter beds. Additionally, the inclusion of refuge islands in the median reduces crossing distance for pedestrians across N Street.

Consistent Ridership
The cycle track had an average daily ridership of 278 between September 2016 and August 2017, and even maintained more than 200 daily riders during winter months. Summer months averaged more than 300 daily riders.

Street Classification
Collector

Right of Way
47-71 feet

Length
1.25 miles

Speed

<table>
<thead>
<tr>
<th>Speed Limit</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

Average Daily Traffic
7,500 BEFORE
4,500 AFTER

Responsible Agency
City of Lincoln
**N Street Context**

- N Street is a major collector that runs east-west through downtown Lincoln. Prior to the project, some blocks were three one-way lanes with diagonal parking, others were two-way with on-street parking, and there was no bicycle infrastructure. In 2012, the Downtown Master Plan Update identified the corridor as the “last mile” to connect the City’s bike trails (Jamaica North and Billy Wolff) that run north-south on opposite ends of downtown. Bike lanes serve as connections with the corridor to the University of Nebraska three blocks to the north.

- After a disappointing first bid, the City spent much of the summer of 2015 educating potential bidders and expanding the original funding sources. The project was assisted by over $200,000 in funding by a local bicycling group, Great Plains Bicycling Club, as well as strong support from the Mayor’s office.

- Throughout the design process, community meetings were held with groups of stakeholders separated by blocks so that local businesses and property owners were involved in the project sections that would most impact them. There was also targeted education for businesses that would have frequent delivery trucks crossing the track into driveways. The City relied on PSAs in local news outlets to educate the community. After construction, there were some problems with drivers turning onto the facility so the City added bollards at those locations. The City also evaluated the timing of the bicycle signals and adjusted them after several months of operation to better suit the needs of cyclists.

- Bioswales and planter beds were incorporated as a buffer between 10th and 16th Streets, addressing stormwater needs and adding a green median to the N Street corridor.
**TWO-WAY CYCLE TRACK**

**Turn boxes** provide an additional measure of safety and priority for cyclists.

Bicycle signals were tested and timed to prioritize cyclists.

**Reduction of traffic lanes** made pedestrian crossings shorter and safer.

Bioswales were a key design element to provide safety as well as ecological services.
200 West & 300 South (Broadway)  

SALT LAKE CITY, UTAH  
Metro pop: 1,186,187 | City pop: 193,744

A protected intersection allows for the continuous separation of protected bikes along two Salt Lake City bicycle corridors.

- The Dutch-style intersection establishes protected connections between two streets with bike facilities.
- The safe intersection helped increase cycling on the newly designed 300 West (Broadway) corridor.

Source: Alta Planning + Design  
Source: City of Salt Lake City

Before & After images of the intersection改造前后对比。
Key Outcomes

Part of a Larger Project
The reconstruction of this intersection was part of the 200 West Protected Bike Lane Project in 2015. Protected bike lanes had been previously installed along 300 South (Broadway) in 2014.

Clear Design
Green paint was used in all bicycling areas, including those protected by curbs. This clearly separates the bicycle and pedestrian facilities from one another.

200 WEST
- Collector Street
- ADT: 2,200
- Speed: 25 mph

300 SOUTH (BROADWAY)
- Collector Street
- ADT: 6,500-8,000
- Speed: 20 mph

RESPONSIBLE AGENCY
- City of Salt Lake City
West Broadway Avenue

JACKSON, WYOMING
Metro pop: 31,464 | City pop: 9,577

Raising the cycle track created a key active transportation connection in Jackson.

- A raised cycle track and sidewalk transformed West Broadway from a typical auto-oriented roadway that was unsafe and uninviting for bicyclists and pedestrians.
- Jackson was able to add this high quality, raised, and therefore separated facility without impacting existing volume of vehicular traffic.
Key Outcomes

Systemwide Increase in Bicycling
Not only has there been an increase in recreational cyclists along West Broadway, but the cycle track has also encouraged residents to use the facility as part of their daily commute. As a result, other bike lanes in the community are also seeing increased ridership.

Adds the Missing Link
The West Broadway improvements were part of a larger project along the West Broadway and WY Highway 22 corridors that was considered the ‘missing link’ in Teton County’s bicycle transportation network.

STREET CLASSIFICATION
Minor Arterial

RIGHT OF WAY
130 feet

LENGTH
1.3 miles

SPEED

<table>
<thead>
<tr>
<th>Speed Limit</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AVERAGE DAILY TRAFFIC

<table>
<thead>
<tr>
<th>Traffic</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>17,500</td>
<td></td>
<td>17,300</td>
</tr>
</tbody>
</table>

RESPONSIBLE AGENCY
Town of Jackson/ Wyoming DOT
And more...

Small investments

- **SE Stark Street**
  - **PORTLAND, OREGON**
  - Metro pop: 2,226,009 | City pop: 583,776
  - A simple application of paint provides clearly delineated bike turning lanes for a major cycling boulevard in a Portland neighborhood.
  - Neighborhood greenways, as bicycle boulevards in Portland are called, provide a well-marked cycling corridors on low-traffic, low-speed streets.

- **Point Grey Rd. & York Ave.**
  - **VANCOUVER, BC, CANADA**
  - Metro pop: 2,463,431 | City pop: 631,486
  - This project completes the missing link in Vancouver’s Seaside Greenway.
  - The Point Grey Road and York Avenue segments of the Seaside Greenway use separated bikeways, traffic control intersections, and the establishment of low-volume neighborhood streets to complete the 37.4 mile path between the Convention Center at Coal Harbor and Spanish Banks Park.
Cortney Geary

CHANGEMAKER SPOTLIGHT

What do you love about cycling?
I bike to get around as much as possible because it is quick, nimble, flexible, and fun. I love that my daily commute is primarily on low-traffic residential streets, buffered and curb/parking protected bike lanes, and the beautiful Walnut Street pedestrian bridge across the Tennessee River. I go out of my way to take this more comfortable, scenic route to work. My favorite thing about biking is how it makes me feel. Starting and ending my workday with a little bit of exercise and fresh air on the bike gets my brain going in the morning and helps me to decompress and leave work behind at the end of the day.
Rethinking Streets & Rethinking Streets for Bikes

Rethinking Streets for Bikes - Available now!

*Rethinking Streets for Bikes* highlights high-quality street retrofit projects that prioritize bicycle transportation. Each case study includes information for key stakeholders, including transportation engineers, planners, policy makers, and community members. The case studies are diverse; there are seven different project types in cities across the United States and Canada.

**Download your copy at the NITC website**

Authors: Marc Schlossberg, PhD; Roger Lindgran, PhD, PE; Dave Amos, AICP; John Rowell, AIA

It’s time to rethink the street.

For too long we’ve been building streets as though they have one function—to move cars quickly. The reality is that streets can do more than just move cars. They can move people on foot, on bikes, on transit, without hurting vehicular throughput and safety. They can be more than a way to get somewhere else. Good streets are good places, too – public places where people meet, sit and socialize, conduct business, wander about, play, and more.

This new book uses evidence from completed street projects from around the United States in order to help communities imagine alternative futures for their streets. The book does not show hypothetical street re-designs, but actual examples from typical communities to show how they did what they did and see what resulted from the change.

Authors: Marc Schlossberg, PhD, John Rowell, AIA, Dave Amos, Kelly Sanford

FREE to download

rethinkingstreets.com

Tell your colleagues!
Thank You!
Download the research discussed today: [https://nitc.trec.pdx.edu/research/project/1081](https://nitc.trec.pdx.edu/research/project/1081)

Upcoming webinars, seminars and trainings: [http://nitc.trec.pdx.edu/events](http://nitc.trec.pdx.edu/events)

The **National Institute for Transportation and Communities (NITC)**, one of five U.S. Department of Transportation national university transportation centers, is lead by the Transportation Research and Education Center (TREC) at Portland State University.

NITC is a six university consortium that includes Portland State University, University of Oregon, Oregon Institute of Technology, University of Utah and new partners University of Arizona and University of Texas at Arlington. We pursue our theme — improving mobility of people and goods to build strong communities — through research, education and technology transfer.

**QUESTIONS?** [asktrec@pdx.edu](mailto:asktrec@pdx.edu)
RETHINKING STREETS FOR BIKES
An Evidence-Based Guide to 25 Bike-Focused Street Transformations

Marc Schlossberg, PhD
Roger Lindgren, PE, PhD
Dave Amos, AICP
John Rowell, AIA

rethinkingstreets.com