BIKING FOR ALL TEXANS
For health, for fun, for transportation
Prof. John Pucher, Rutgers University
Walking and Bicycling: 
the *MOST* sustainable transport modes

• **MOST environmentally friendly:**
  >Virtually no pollution at all 
  >Almost no nonrenewable resources used

• **MOST equitable:**
  >Financially affordable by virtually everyone 
  >Physically possible by all but the severely disabled

• **MOST economical:**
  >Minimal private and public costs 
  >Although they take more time, they provide exercise that reduces medical costs and greatly extends our healthy life expectancy

Pucher: Biking for all Texans
BICYCLING IS HEALTHY!
Provides valuable physical activity

• Both for daily travel and for recreation
• Cheaper, easier, and more dependable than formal exercise routines
• Can be integrated into daily lifestyle to achieve practical travel needs

Pucher: Biking for all Texans
Crucial importance of regular physical exercise:

• Obviously, the daily physical exercise of walking and cycling for practical travel helps burn up calories and helps avoid the problems of *overweight and obesity*

• Moreover:

“Whether normal-weight, overweight, or obese, physically inactive persons are 2 to 3 times more likely to die prematurely.”


Pucher: Biking for all Texans
Huge Health Benefits of Even Small Increases in Physical Activity


Pucher: Biking for all Texans
Obesity Rate by Country (Body Mass Index ≥ 30)
(percentage of adults)

Does speaking English make us fat?

Pucher: Biking for all Texans
Obesity Trends* Among U.S. Adults

**BRFSS, 1990, 1999, 2008**

(*BMI ≥30, or about 30 lbs. overweight for 5’4” person)
Worsening Obesity Epidemic among American Children and Adolescents, 1963-2002 (% with body mass index of 30+)

**NOTE:** Excludes pregnant women starting with 1971-74. Pregnancy status not available for 1963-65 and 1966-70. Data for 1963-65 are for children 6-11 years of age; data for 1966-70 are for adolescents 12-17 years of age, not 12-19 years.

**SOURCE:** CDC/NCHS, NHES and NHANES

Pucher: Biking for all Texans
Does auto-dependency make us fat? Obesity falls sharply with increased walking, cycling, and transit use!

![Graph showing the relationship between obesity and walking, biking, and transit use across different countries.](image-url)
Lots of Potential for Increased Cycling in the USA: Short trips

Many daily trips in American urban areas are short enough to make by bike!

- 25% of all trips in U.S. metro areas were a mile or shorter in 2001
- 40% of all trips were shorter than two miles

Pucher: Biking for all Texans
Lots of Potential for Increased Cycling in the USA:
Almost EVERYONE *could* bike!

- Cycling is possible at any age, except for very young and very old
- Women can cycle as well as men
- Cycling possible for wide range of skills and physical fitness
- Cycling affordable by everyone

Pucher: Biking for all Texans
Bike share of trips in Europe, North America, and Australia

(percent of trips by bike)
Increase in Bike Share of Trips in Cities Around the World

Increase in Bike Share of Trips in Cities Around the World

Share of Workers Commuting by Bike in Texas Cities 2006-2008 (percent)

Source: U.S. Census Bureau, American Community Survey
Women’s share of bike trips in Europe, Australia, and North America

Pucher: Biking for all Texans
Women’s Share of Bike Commuters to Work in Texas Cities, 2006-2008 (percent)

Source: U.S. Census Bureau, American Community Survey

Pucher: Biking for all Texans
Cycling can start at a very young age

Foto by Marie Demers

Pucher: Biking for all Texans
And we can keep cycling all life long!!!

Pucher: Biking for all Texans
Bike Share of Local Trips by Age Group in the USA, Germany, Denmark, and the Netherlands (2000-2002)


Pucher: Biking for all Texans
Mother and kids cycling together in Amsterdam
Parents and kids cycling together in Portland
How grandmothers transport grandkids in Netherlands

Pucher: Biking for all Texans
CYCLING IS DIVINE!!

How Catholic nuns get around in Muenster, Germany
Make Cycling Safe for Everyone!

- 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 high levels of cycling there

Pucher: Biking for all Texans
Cycling Fatality Rates in North America and Europe, 2002
(cyclist deaths per 100 million km cycled)

Separate cycling facilities are key to the much safer cycling in Denmark and the Netherlands


Pucher: Biking for all Texans
The Dutch do **NOT** wear safety helmets, yet have the safest cycling in the world!

Pucher: Biking for all Texans
SAFETY IN NUMBERS

• As levels of cycling increase, injury and fatality rates per trip and per km traveled fall dramatically.

• Thus, if we can increase cycling, it will almost inevitably be safer.

Pucher: Biking for all Texans
Public Policies *Crucial* to Increase Cycling

- Pro-car policies in European cities in 1950s and 1960s caused huge decline in cycling
- Dramatic policy turn-around since 1970s to limit car use and promote cycling, walking, and public transport in Dutch, Danish, and German cities

*Pucher: Biking for all Texans*
Bridge in Freiburg BEFORE and AFTER reforms

avant

Aujour d’hui

Pucher: Biking for all Texans
Typical residential street in Freiburg
BEFORE traffic calming reforms

Typical residential street in Freiburg
AFTER traffic calming reforms

Pucher: Biking for all Texans
Pucher: Biking for all Texans
How to Increase Cycling and Make it Safer

• Better cycling route facilities and bike parking
• Integration of walk/bike with public transport
• Traffic calming of residential neighborhoods
• Mixed-use zoning and improved urban design
• Restrictions on motor vehicle use
• Traffic education and Safe Routes to School
• Traffic regulations and enforcement

Pucher: Biking for all Texans
Most European cities have extensive car-free districts ideal for walking and cycling.

Pucher: Biking for all Texans
Pucher: Biking for all Texans
Bikes and buses take up much less space than cars!!

Demonstration on main street of Muenster how much space cars take compared to buses or bikes to transport the same number of people

Pucher: Biking for all Texans
Cycle tracks such as these make it safe and comfortable for all to bike: including women, children, and seniors
Cycling for EVERYONE

Pucher: Biking for all Texans
Bicycle expressway-beltway in Muenster, Germany

Note exclusive cycle path in middle and completely separate pedestrian walkways on both sides.

Pucher: Biking for all Texans
Walkable and Bikeable European suburbs

Most new suburban developments in Germany and the Netherlands have sidewalks and cycle paths

Pucher: Biking for all Texans
Santa Barbara coastal path: Safe and attractive both for cyclists and pedestrians

Conversion of two car lanes to bike path and wider sidewalk

Pucher: Biking for all Texans
Wide bike lane in Santa Barbara, well away from parked cars

Pucher: Biking for all Texans
Ideal solution for arterials: Traffic-protected cycle track on 9th Avenue, Manhattan

Pucher: Biking for all Texans
Typical intersection in Copenhagen, with separate crossings for pedestrians and cyclists

Pucher: Biking for all Texans
Bike crossing designed to reduce likelihood of right-turning car hitting cyclist crossing intersection

Pucher: Biking for all Texans
Bike access lane approaching intersection in Dutch city

Pucher: Biking for all Texans
Using special markings to raise visibility and safety of crossing

Pucher: Biking for all Texans
Improving safety of cycle tracks at road crossings
Contraflow lane in Strassbourg, France

Pucher: Biking for all Texans
Contra-flow cycling permitted on most local streets even without special lanes

Pucher: Biking for all Texans
Contra-flow bike access in Vancouver

Foto: Gordon Price

Pucher: Biking for all Texans
Bike bridge along Yarra River in Melbourne

Bike bridge along Ems River in Muenster

Pucher: Biking for all Texans
Brisbane’s floating bikeway

Pucher: Biking for all Texans
Extensive, fully-integrated bikeway network in Freiburg, Germany

CRUCIAL to have full connectivity of cycling facilities! Usually lacking in North America

Pucher: Biking for all Texans
Recommended route appears in red on computer screen, along with trip details shown at top of screen, and more!
Bike Route Planning by Mobile Phone, with suggested route shown on LCD display
Special traffic signals and signs give priority to cyclists.

Pucher: Biking for all Texans
Bike crossing signal in Amsterdam
Four-way all-green signal for cyclists in Portland

**How to Use the New Bicycle Signal**

1. **To Get a Green Light**
   Place your bicycle on the marking on the sidewalk, with your wheels directly on the lines.

2. **When the bicycle signal here is green...**
   ...cyclists can cross the intersection as shown here.

3. **Place wheels on lines**

**Pucher: Biking for all Texans**

Bike sensor in pavement
Bike sensors in pavement to trigger green light for cyclists in Richmond, Metro Vancouver, BC
Bike lane, advance stop line, and priority signal for cyclists in Muenster
Highly visible red bike lanes for intersection crossings on all four sides, connected with red brick sidepaths on both sides of every road

Muenster, Germany

Pucher: Biking for all Texans
Raised curb protects bike path from cars

Green wave for cyclists in Odense, Denmark

Troels Andersen, “Cycling in Odense, Denmark”

Express bikeways for commuters

Bike speed indicators

Pucher: Biking for all Texans
Denmark: Ubiquitous short-cuts for right-hand turns and full-speed ahead for cyclists at red lights at T-intersections

Pucher: Biking for all Texans
Innovative directional signs and bike trip counters in Denmark

Photo by Susan Handy

Pucher: Biking for all Texans
Good bike route signage is crucial

Pucher: Biking for all Texans
Convenient air pumps for bikes throughout Odense

Pucher: Biking for all Texans
Traffic Calming of Residential Neighborhoods

• Speed limited *by law* to 30km per hour (19mph) or less

• *Physical measures* that force cars to slow down:
  • Road narrowing, zigzag routing, chicanes
  • Raised intersections and crosswalks
  • Traffic circles
  • Speed humps and bumps
  • Mid-block closures and artificial dead-ends
  • Bulb-outs at intersections and crosswalks, with sidewalk widening

Pucher: Biking for all Texans
Traffic Calming Measures

Volume Control Measures
- Full & partial closures
- Diverters
- Median barriers
- Forced turn islands

Speed Control Measures
- Active Measures
- Passive Measures

Horizontal Deflection Measures
- Roundabouts
- Mini Roundabouts
- Chicanes
- Alternate Side Parking
- Realigned Intersection
- Center Island Medians

Constrictions
- Curb Extensions
- Neck downs
- Chokers
- Slow Points
- Gateways
- Ped. Refuge Islands

Vertical Deflection Measures
- Speed Humps/Tables
- Raised Crosswalks
- Raised Intersections
- Speed Cushions

Pucher: Biking for all Texans
Why Traffic Calming Saves Lives

Speed Humps

Chokers

Traffic Circle

Raised Crosswalk

Pucher: Biking for all Texans
Curb Extension
Neckdown/Bulbout
Median Island
Chicanes

Pucher: Biking for all Texans
Traffic calming in Vancouver that promotes cycling while discouraging car use

One-way for cars, two-way for bikes

Pucher: Biking for all Texans
Convenient bike cut-thru for cyclists in Melbourne

Pucher: Biking for all Texans
Traffic Calming in Freiburg, Germany

Improves safety and encourages more walking and cycling

Pucher: Biking for all Texans
Traffic Calming in Freiburg, Germany

Improves safety and encourages more walking and cycling

Pucher: Biking for all Texans
Woonerf (home zone) in Netherlands

Pucher: Biking for all Texans
Traffic calming turns these streets into bikeways

Bike Boulevards in Portland

Pucher: Biking for all Texans
**Fahrradstrassen** in Germany, **bicycle streets** where cyclists have absolute priority over cars for entire width of roadway.
BIKE TRANSIT INTEGRATION
Over 50,000 buses in the USA now come equipped with bike racks
Trend in Percentage of Buses with Exterior Bicycle Racks in the USA, 2001-2008

(Source: APTA, Public Transportation Factbook 2008, Table 23)
New Bike Station in Washington, D.C.

Photo: Ralph Buehler
Bike Station in Muenster, Germany

Photo: Peter Berkeley
Bike Wash at Muenster Bike Station

Pucher: Biking for all Texans
Simple but convenient bike parking even at bus stops
Bike on LRT in NJ and Minneapolis

Photo: John Boyle

Photo: Metro Transit
Bike parking at light rail transit stop in Freiburg, Germany
Bikes on Caltrain in San Francisco

Photo: San Francisco Bicycling Coalition
Conversion of car parking to bike parking in San Francisco

Also being adopted in other US cities

Pucher: Biking for all Texans
Bike parking in Netherlands
Secure, sheltered bike parking

Pucher: Biking for all Texans
Traffic Education

• Improved motorist training, with *much* more emphasis on how to avoid endangering pedestrians and cyclists

• Compulsory traffic safety lessons for all school children by the age of 10, with testing by traffic police on actual traffic test courses, to ensure safe and defensive walking and cycling by an early age (as in the Netherlands and Germany)

Pucher: Biking for all Texans
German traffic laws generally favor cyclists and pedestrians over motorists.

Pucher: Biking for all Texans
Most German and Dutch children take cycling lessons by the 3rd or 4th grade and must pass a police-administered cycling safety test!
MARKETING CYCLING TO ALL SOCIAL GROUPS

• Very diverse needs of different groups

• Need to tailor cycling facilities, policies, and programs to serve this broad range

• Be as inclusive as possible

• Need good facilities as well as active marketing of cycling, with different approaches to each potential group of cyclists
Cycling Duckie for very young kids in Odense, Denmark

Troels Andersen, “Cycling in Odense, Denmark”

Pucher: Biking for all Texans
Cycling competitions for somewhat older kids in Odense, Denmark
Cycling training course for adults in Metro Vancouver

You are never too old to learn!!!
GIVE EMPLOYEES FREE BIKES INSTEAD OF FREE PARKING!

The perfect zero emissions vehicles!

Troels Andersen, “Cycling in Odense, Denmark”

Pucher: Biking for all Texans
Get on a bike and lose weight!

“Get rid of the sack” Campaign aimed at overweight middle-aged men with pot bellies

Troels Andersen, “Cycling in Odense, Denmark”

Pucher: Biking for all Texans
Guided Bicycle Tours for Seniors

Pucher: Biking for all Texans
Safe Routes to School:
Enable Children to Walk or Bike to Schools!

- Two thirds of American children who live within a mile of their school travel there by car

- Only 13 percent of children in the USA walked or biked to school in 2001, compared to 60 percent in 1974

- Most European children walk or bike to school, some ride transit, virtually none get chauffered by their parents or drive themselves

- Need improved walking and cycling facilities to prevent dangerous conflicts with motor vehicles, especially at crossings and intersections

Pucher: Biking for all Texans
Trend in Obese Children vs. Rate of Biking and Walking to School

- percent of kids who bike or walk to school
- percent of kids who are obese

Pucher: Biking for all Texans
How kids get to school in the Netherlands

Pucher: Biking for all Texans
Bike to School Day in California

Pucher: Biking for all Texans
Mixed-Use Zoning and Better Urban Design

• Inclusion of *sidewalks and bikeways or bike lanes* in all new suburban developments and retrofitting of existing developments, where possible

• *Mixed land use zoning* so that residential units are within easy walking or cycling distance of cultural facilities, shopping, and service establishments

• Encouragement of *compact, mixed-use development around transit stops* to facilitate walking/bicycling communities (transit-oriented development) through subsidies, mortgage bonuses, and zoning.

• *Restrict parking lots* to locations behind buildings rather than between buildings and the street (as with most strip mall development in USA).

Pucher: Biking for all Texans
Traffic Regulations and Enforcement

• *Revise traffic laws to place burden of proof on motorists*, with the assumption that motorist is guilty unless it can be shown otherwise, especially when children or elderly are involved in crashes (forcing motorists to be extra careful to avoid crashes with pedestrians and cyclists)

• *Enforce existing legal rights of pedestrians and cyclists*, with strict penalties and fines for motorist violations of ped/bike rights of way in crosswalks, bike lanes, intersection crossings.

• *Traffic cameras at intersections to photograph motorists* failing to stop or yield when required to do so, with automatic ticketing for violations

Pucher: Biking for all Texans
CONCLUSIONS:

- Bicycling should be for ALL TEXANS, including women, children, and seniors
- Bicycling is healthy, cheap, fun, and saves time
- Many ways to encourage more cycling and make it safer
- Crucial to design bicycling facilities and programs for EVERYONE! Be as inclusive as possible!
- Public information campaign needed to emphasize both direct and indirect public health benefits of walking and cycling

Pucher: Biking for all Texans
For any questions or further information, please contact:

Prof. John Pucher
Bloustein School of Planning and Public Policy
Rutgers University
33 Livingston Avenue, Room 363
Email: pucher@rutgers.edu
Webpage: http://policy.rutgers.edu/faculty/pucher.html