# Sustainable Campus Transportation in the United States

University of Idaho
Sustainable Transportation Conference
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# Why sustainability?

- Unprecedented threat of global climate change
- Approaching end of the oil age
- Natural ecosystems in decline

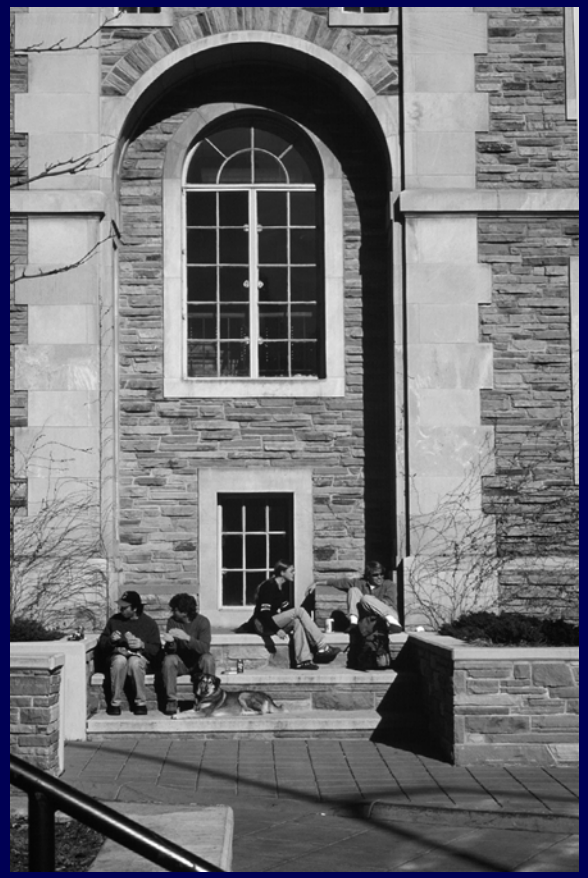
# Key areas for action

- **Educating students to be environmentally literate citizens**
- **Providing technical and policy research to assist the broader community**
- **Reducing the environmental footprint of the university community**

# Reducing the footprint

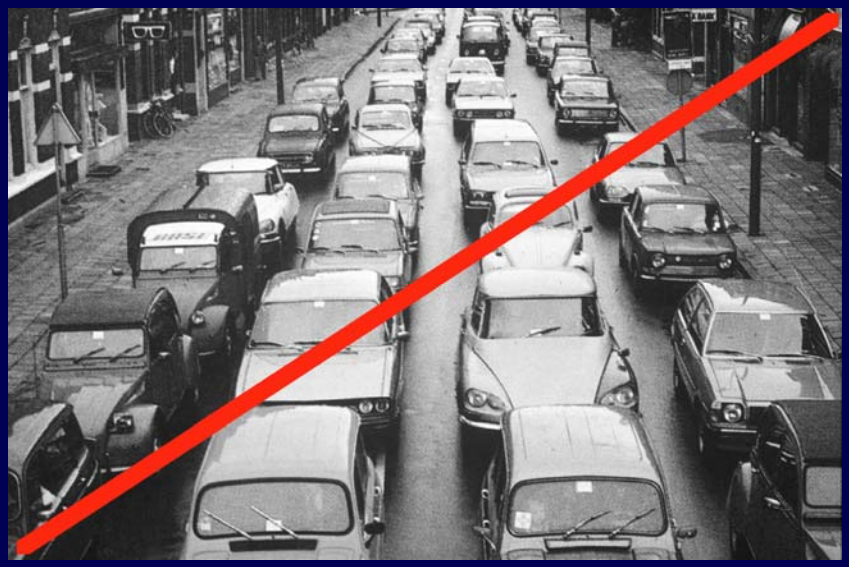
- Creating climate-friendly campuses
- Greening campus materials consumption patterns
- Moving towards a zero waste paradigm……and
- Reducing automobile dependence of students, faculty, staff

# What Are universities looking for?



- Mobility and Access
- Inexpensive transportation
- Quality campus experience
- Convenience
- Adequate parking
- Best use of limited dollars
- Best use of limited debt capacity

# What are communities looking for?



- Managing congestion on city streets
- Reducing student and faculty parking demand in neighborhoods
- Maintaining good relations with universities

# The Parking Squeeze

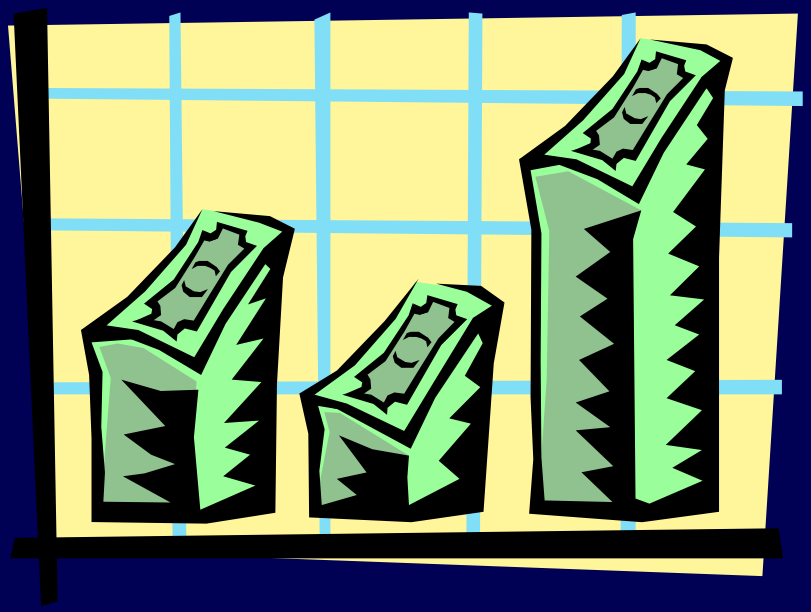
- Surrounding community resents overflow parking
- New academic buildings often displace parking lots
- For many campuses, the only way to expand parking is to build structures

# Construction Costs

Parking garage construction at Florida Community College, Jacksonville.

- Surface parking $1500-$5000/space
- Structured parking $10,000-$30,000/space
- As structured parking increases, monthly rates increase: at CU Boulder 0%=%13.50/month, 20%=$30/month, 100%=$200/month!
- All of these assume land has no cost

# Debt constraints



- Most schools must borrow money and take on debt
- Debt capacity is limited by bond rating agencies
- Even if parking users can pay annual costs, parking expansion still requires use of university debt capacity

# Elasticity of Demand

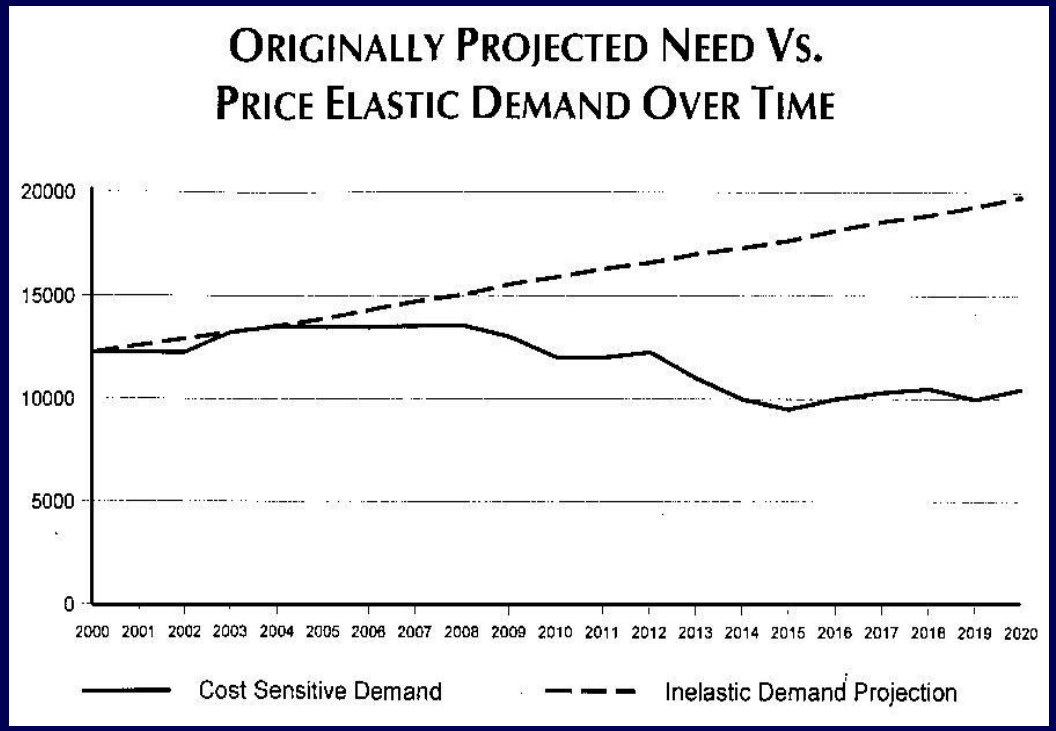

Photo courtesy of Spenser Havlick

- When price goes up, demand goes down
- Future parking demand projections should include effect of price on demand - otherwise too much parking will be built

# U California Parking Committee:

- "There's some possibility that extremely high parking fees will lead to a substantial exodus to alternative transportation, a serious problem for supporting loan payments for the expensive new garages; we could even face a "death spiral," in which high rates reduce permit demand leading to even higher rates, etc." –UC parking committee.

# Colorado State University Study




Courtesy of Nelson/Nygaard Associates

- Price increases required to expand parking supply at CSU reduce demand in half.

# Cheaper approaches


Photo courtesy of University of Colorado Environmental Center

- Transit passes typically cost $5-$15/month; involve no debt
- Cost of one new bicycle parking space: ~$150
- Market incentives - net revenue gain if parking charges are increased

# Alternative paths


Photo courtesy of Spenser Havlick

- New vision for campus transportation based on:
  - expanded transit access (routes and pass programs)
  - market incentives to reduce parking demand
  - better bike/pedestrian networks
  - housing closer to campus

# Transit Pass Programs


Transit super-stop at the University of Colorado, Boulder, CO

- Over 50 universities totaling over 800,000 students and staff offer transit passes
- Average cost of $30/student per year
- Student ridership increased between 71% and 200% - inaugural year of programs
- For info: Shoup and Hess at:

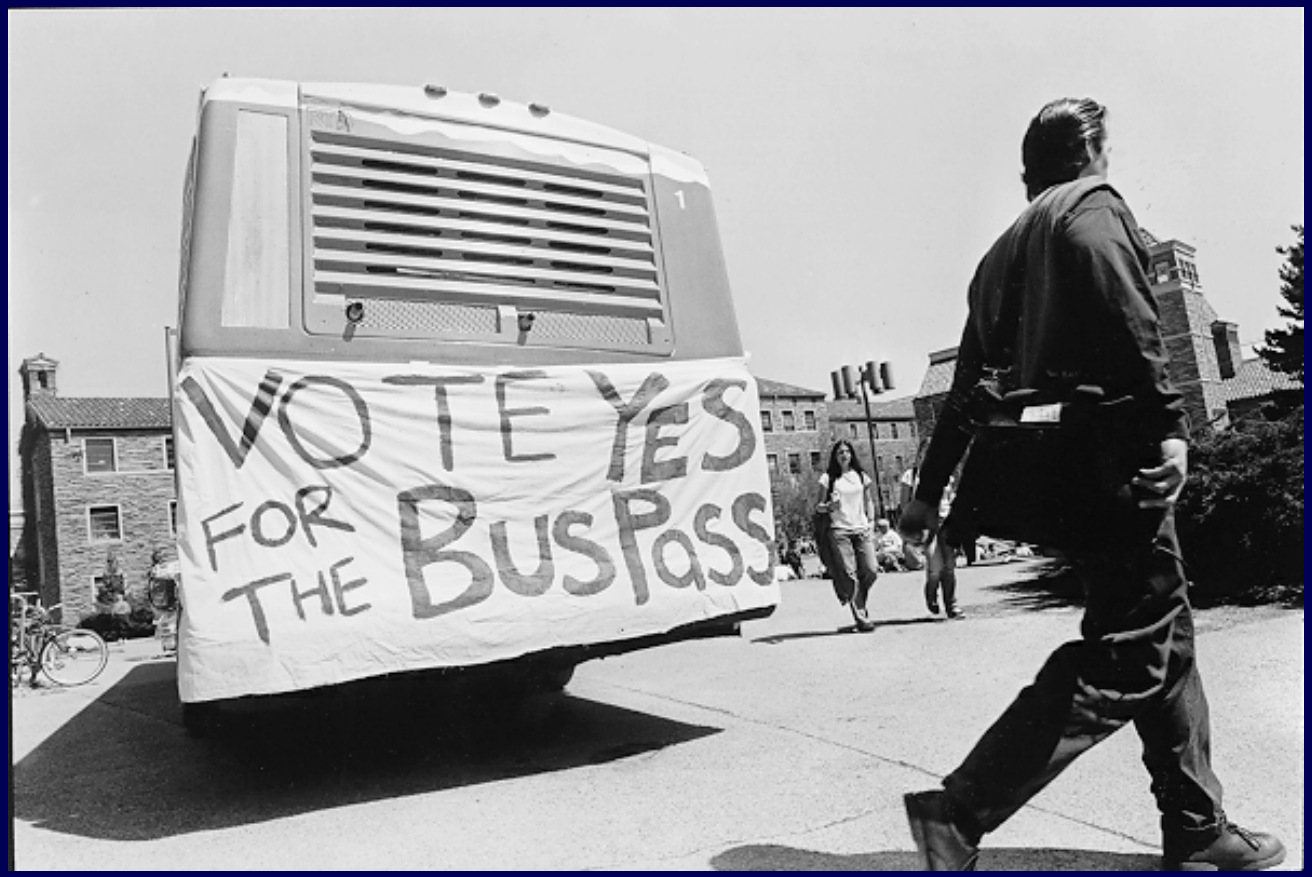
http://www.sppsr.ucla.edu/its/ua/

# Student transit pass programs


Photo courtesy Go Boulder

- Unlimited use, photo-ID transit passes
- Students vote to pay a fee for access to local and regional routes
- Faculty/staff passes paid from general fund and parking revenues
- Proven to increase ridership & reduce single occupant vehicle travel

# Student campaign for bus pass



# Transit Pass Economics at the University of Colorado

- The University of Colorado-Boulder faculty/staff bus pass reduces parking demand by 350 spaces, at a cost of $1125/space
- Cost to add parking - $2723/space

# Transit pass economics

- 14 transit users visible on this sidewalk .
- At $20,000/net new space, $280,000 to serve through parking

# Managing demand through price

- Parking demand goes down as price goes up - ~1% per dollar
- Switching from free parking to paid parking reduces driving by 15-40%
- Expanding parking supply generally requires price increases
- In many cases managing demand through price increases will actually be less costly to parkers than a supply side approach!
- Can also pay people not to drive!

# Advantages of using financial incentives

- No use of debt capacity
- Net new revenue can be generated - unlike a supply side approach where new revenue pays for new parking
- Low risk approach - easily reversible since no long term debt

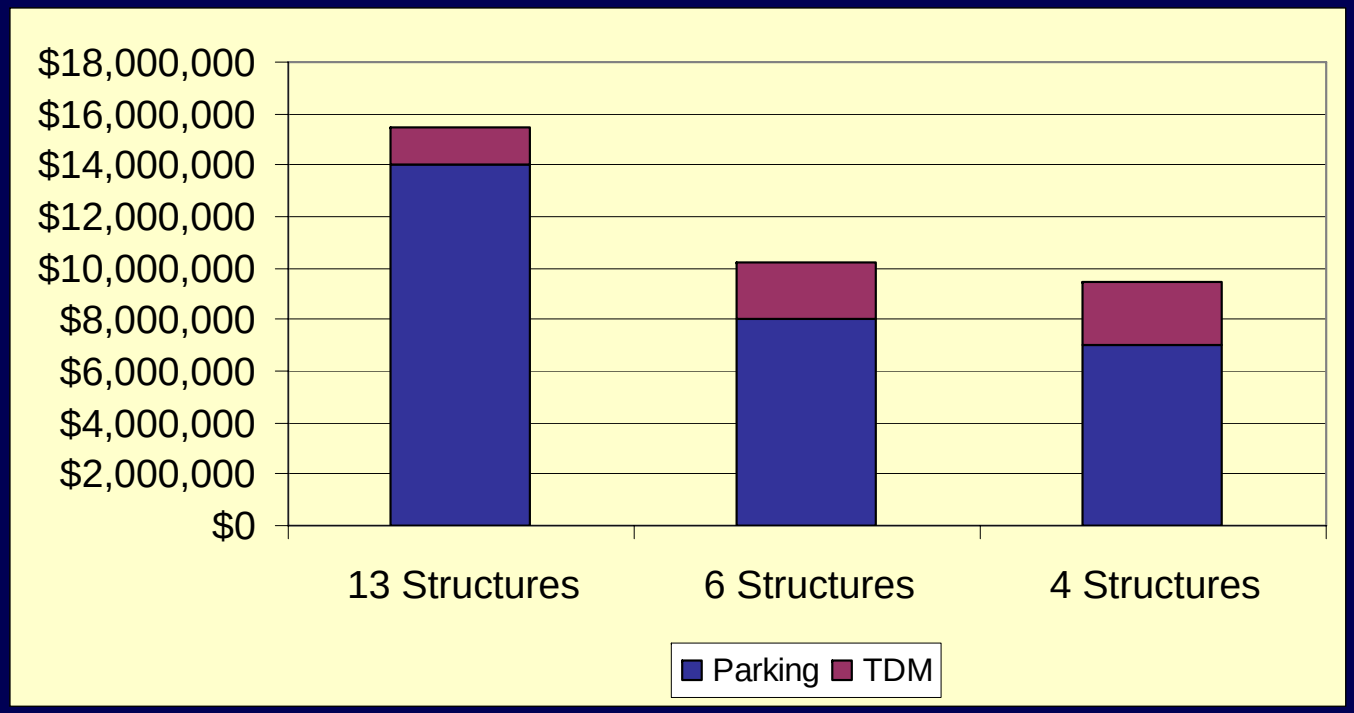
# Stanford University Clean Air Cash Program

Photo courtesy of Stanford University

- Early 1990s created financial incentives to drive less
- Employees who choose not to buy a parking permit are paid $144/year
- Parking rates raised 15%/year
- Net effect: added 2 million square feet of buildings with no increase in traffic!

transportation.stanford.edu.

# Least cost planning at U of California




- Cost analysis by Nelson/Nygaard

# The Bicycle - Vehicle For a Small Planet


Photo courtesy of Spenser Havlick, enhancement courtesy of Charles Bloom

- One bike parking space costs about $150 - compared to $3000-$30,000 for one car
- Efficient use of space
- Most energy efficient form of transportation
- Low cost to users

# UC DAVIS - Taking Bicycles Seriously

- Generally flat land area
- About 15,000 bicycles on campus daily
- 14 miles of bicycle paths and 12 miles of shared roadway on 832 acres
- Bicycle signal heads
- Bicycle traffic circle
- 60% of student trips to campus are bike/ped

http://www.ucdavis.edu/

# UC Santa Cruz bike trailer

- An innovative solution to a campus on a hill!

# University of New Hampshire

Photo courtesy of UNH Office of Sustainability

- Yellow Bike Program
  - Membership fee
  - Dependable user-oriented transportation

- Blue Bike Program
  - Departmental errands
  - No obligation trial

Photo courtesy of UNH Office of Sustainability

University of New Hampshire Office of Sustainability:
http://www.sustainableunh.unh.edu/

5 acre parking lot; $10 million structure; or…

# Funding Options

Parking Services employee collecting meter money at the University of Colorado Campus, Boulder
Photo courtesy of Charles Bloom

- Parking revenues
- Student fees for transit
- Parking fines
- General fund dollars
- Federal grants
- Capital project mitigation fees

# University of Colorado Approach

- University of Colorado, Boulder
  - Student Pass and Faculty/Staff ECO Pass: Transit passes create demand
  - HOP, SKIP, JUMP, BOUND, DASH, STAMPEDE: Quality transit service designed by current/potential customers
  - Quality pedestrian/bicycle systems
  - Gradual increases to parking rates

# Boulder’s policy context

- **1996 Transportation Master Plan**
- **Goal: Cap vehicle miles traveled at 1994 levels; reduce SOV mode share to 25%**

# Designing Quality Transit Service in Boulder

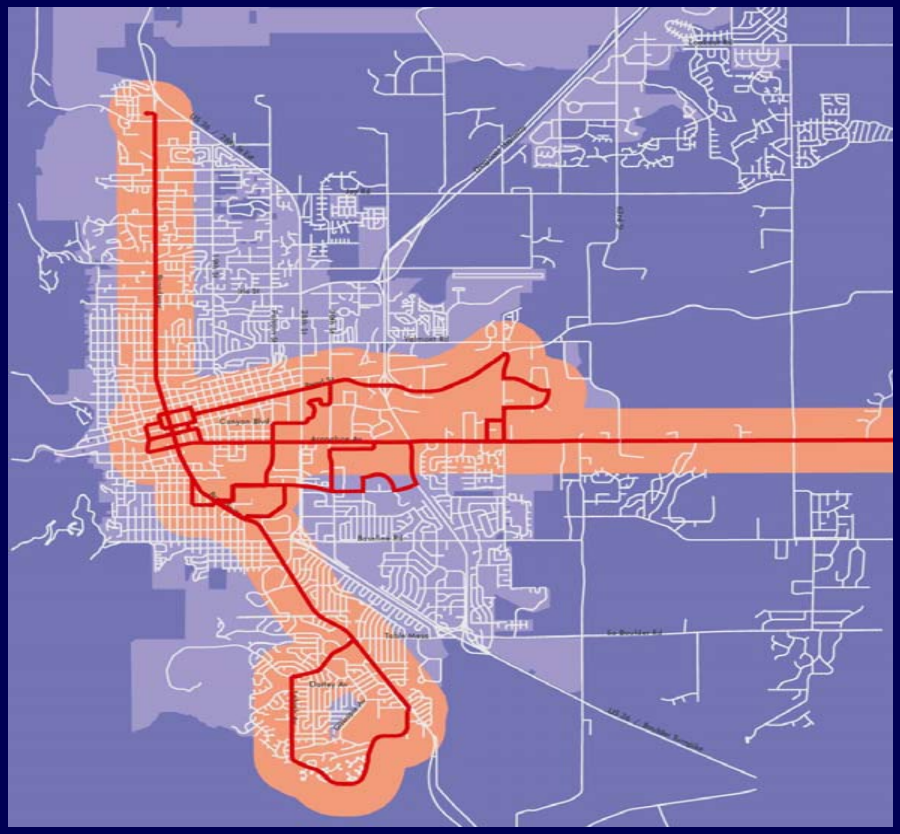
- Meet the needs of the customer dependably and efficiently
- High frequency routes: 5-10 minute headways
- Extended service hours
- Community helps design routes
- Simple routes - grid system and circular shuttles
- Brightly painted, color coded buses
- Branding - HOP, SKIP, JUMP instead of numbered routes
- Supported by local pass programs

# Partnership is key!

- University (CU), city, and transit district (RTD) are key partners
- CU, city and RTD share funding for high frequency transit routes, new transit superstops, real time information
- City provides planning and marketing support
- University provides demand base to justify higher frequencies

# High frequency transit routes



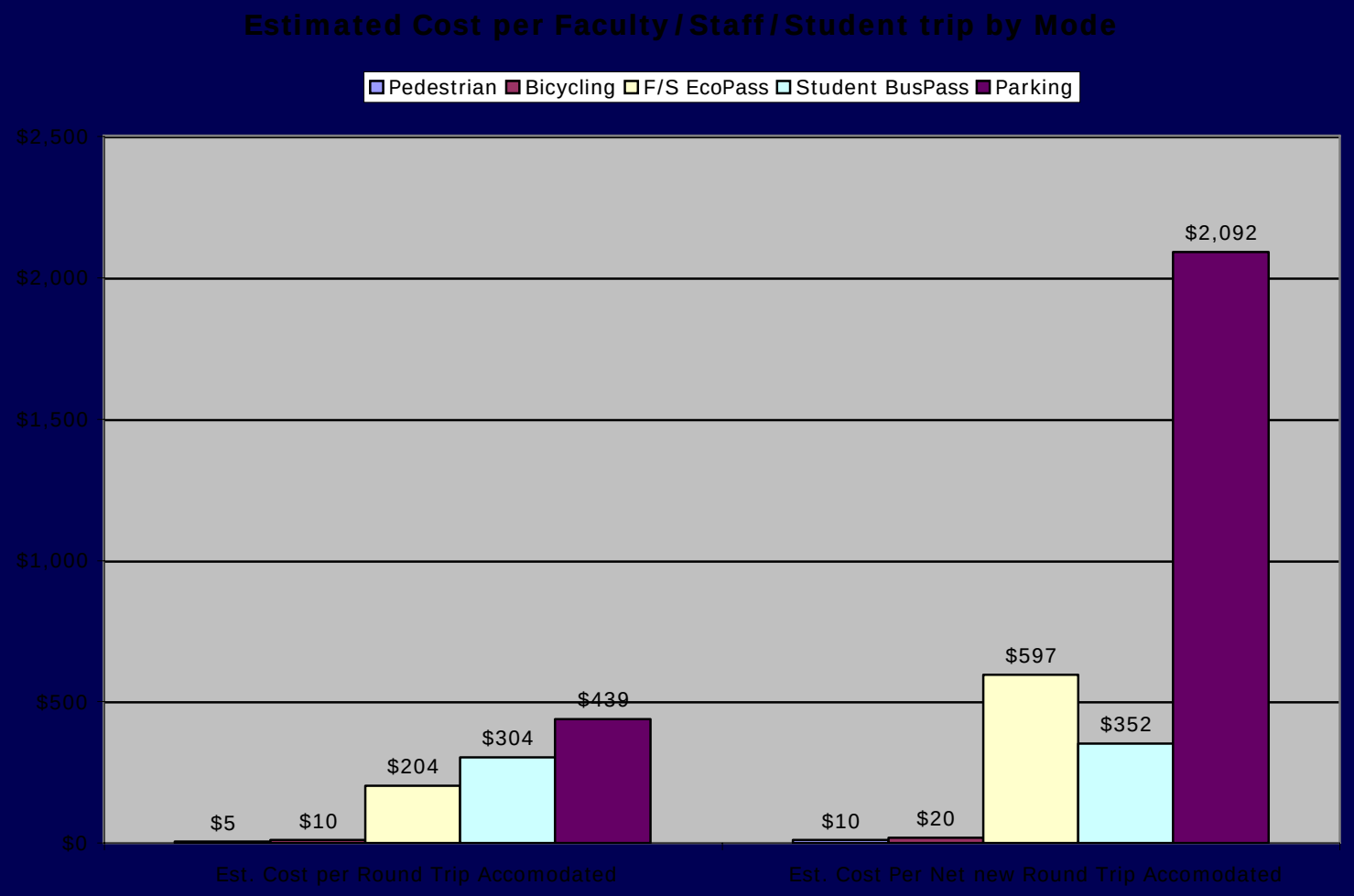


# Measurable Results: Student Travel at the University of Colorado

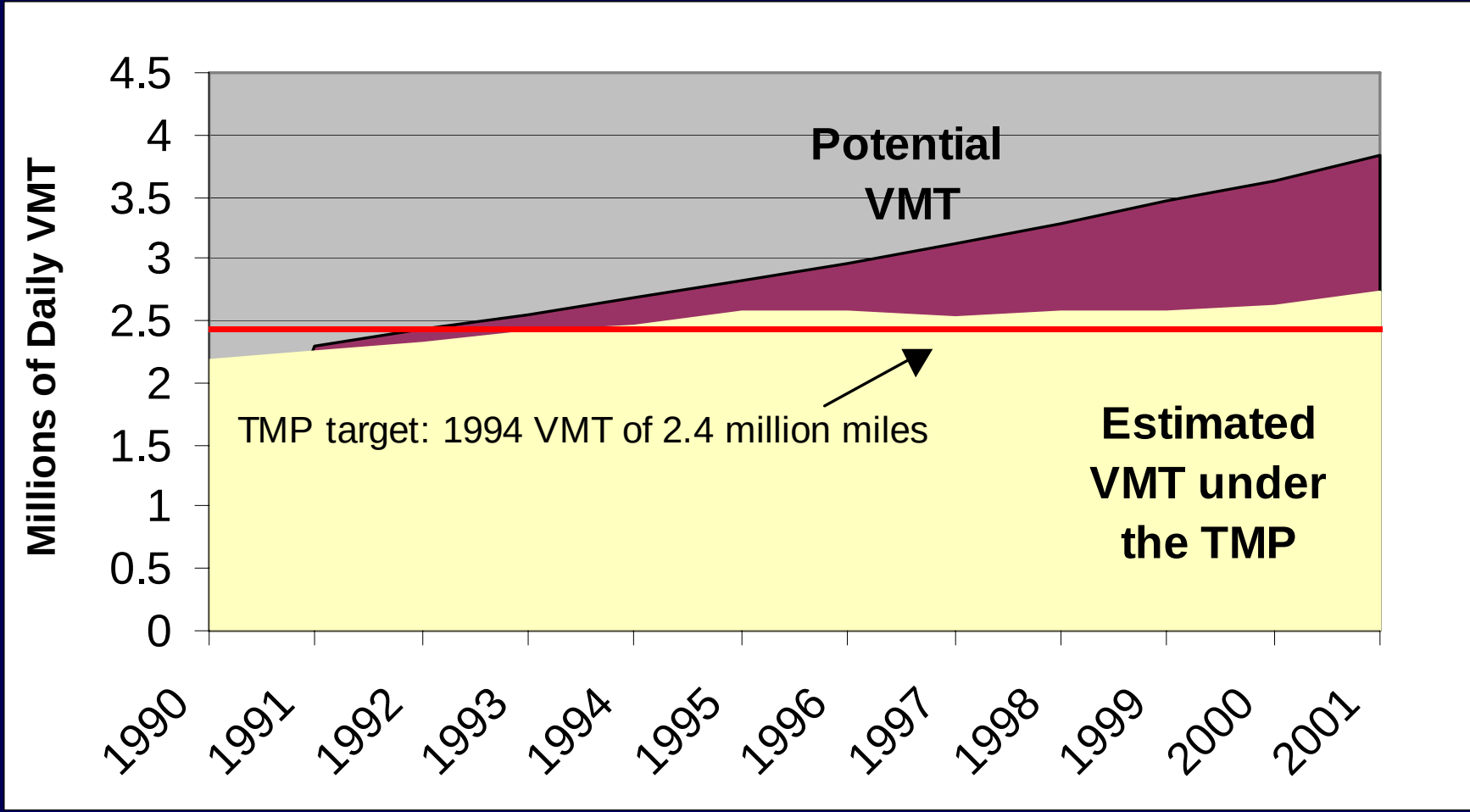
- Vehicular Trips
  - 1990 to 2000, 55% to 38%; respectively; 12% for trips to campus
- Transit
  - 2% to 12%
- Biking
  - 20% to 31%
- Walking
  - 23% to 19%

(Source: “Modal Shift in the Boulder Valley”, National Research Center, 2001)

# Comparative cost by mode



# Growth in Vehicle Miles Traveled



# U Washington Caps Traffic!

Photo courtesy of University of Washington

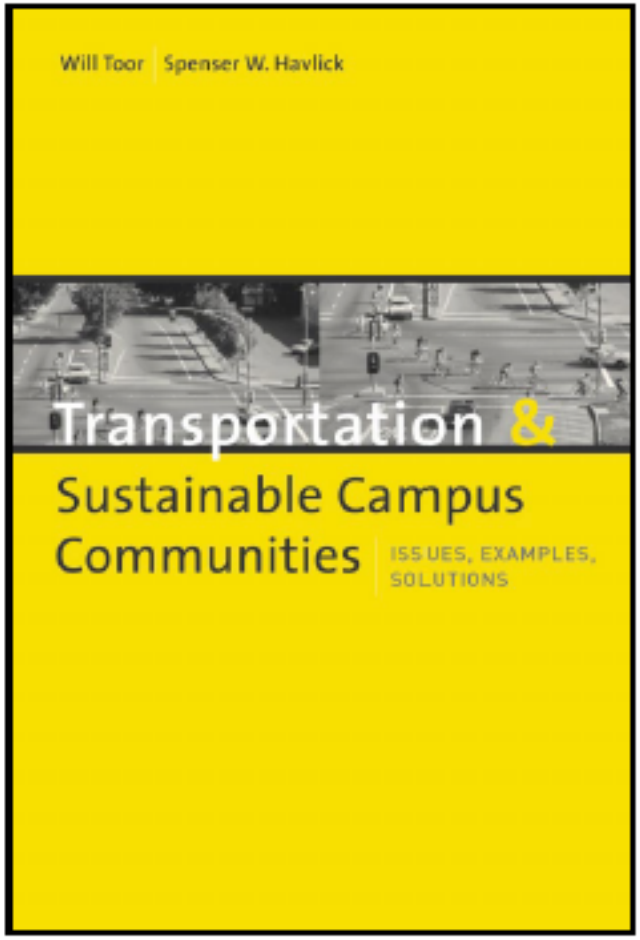
- Binding agreement with Seattle to cap traffic to campus
- Gradually increasing parking rates
- U-PASS
  - Unlimited rides within King and Snohomish Counties
- Results: 5% reduction in traffic during 1990s, while population grew 7%

http://www.washington.edu

# U of CA student sustainability campaign demands

- "That the University of California reduce the fossil fuel consumption of its fleet by 50% in the next 10 years. And that the University set a goal to achieve climate neutrality (zero fossil fuel consumption) for its fleets by 2040."
- "That the University of California set as a goal for it's campuses a reduction of the number of staff, faculty and students commuting in single occupancy vehicles by 20% in the next ten years. And that the University work towards an additional 20% reduction in single occupancy commuting by 2025."

# For more information:




- For more details, check out this book!
- It can be ordered at

www.islandpress.org

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