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

- 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
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

- 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

Photo courtesy of Spenser Havlick
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

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

- 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

Photo courtesy of University of Colorado Environmental Center
Alternative paths

- 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

Photo courtesy of Spenser Havlick
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

- 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

Photo courtesy Go Boulder
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

- 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.

Photo courtesy of Stanford University
Least cost planning at U of California

Cost analysis by Nelson/Nygaard
The Bicycle - Vehicle For a Small Planet

- 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

Photo courtesy of Spenser Havlick, enhancement courtesy of Charles Bloom
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

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

**Blue Bike Program**
- Departmental errands
- No obligation trial

University of New Hampshire Office of Sustainability: [http://www.sustainableunh.unh.edu/](http://www.sustainableunh.unh.edu/)

Photo courtesy of UNH Office of Sustainability
5 acre parking lot; $10 million structure; or...
Funding Options

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

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

Estimated Cost per Faculty/Staff/Student trip by Mode

- Pedestrian
- Bicycling
- F/S EcoPass
- Student BusPass
- Parking

Est. Cost per Round Trip Accommodated
- $5
- $10
- $204
- $304
- $439

Est. Cost Per Net new Round Trip Accommodated
- $5
- $10
- $20
- $597
- $352

Total: $2,092
Growth in Vehicle Miles Traveled

Potential VMT

Estimated VMT under the TMP

TMP target: 1994 VMT of 2.4 million miles
U Washington Caps Traffic!

- 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%

Photo courtesy of University of Washington

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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