Skateboarding as an emerging travel mode: Travel behavior and planning implications

Dr. Kevin Fang – UC Davis/San Jose State University
Precourt Center Sustainable Mobility Seminar – April 15, 2016
Skateboarding as a mode of travel? Really?
## California Household Travel Survey (2012)
### Non-motorized mode choice options

<table>
<thead>
<tr>
<th>Mode</th>
<th>All trips</th>
<th>Work Trips</th>
<th>School Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk</td>
<td>16.2%</td>
<td>2.4%</td>
<td>15.6%</td>
</tr>
<tr>
<td>Bike</td>
<td>1.5%</td>
<td>2.3%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Wheelchair/Mobility Scooter</td>
<td>0.10%</td>
<td>0.03%</td>
<td>0.01%</td>
</tr>
<tr>
<td>Other Non-Motorized (Skateboard, etc.)</td>
<td>0.14%</td>
<td>0.11%</td>
<td>0.23%</td>
</tr>
</tbody>
</table>

**Skateboarders only mode mentioned by name for “other”**

**Other:** 0.14% of trips ➔ Extrapolates to 48 million miles/year

0.23% of school trips ➔ Extrapolates to 25,000 students
University of California, Santa Barbara

7% of students skateboard to campus

6% drive alone

(S UCSB Budget and Planning, 2014)

San Jose State University

↑ in popularity over time
0% in 2005
0.5% in 2008
1.2% in 2014

Double motorcycle share

Intra-campus trips not counted *Might be majority of skating

(SJSU Commute Survey, 2012)
Other skateboard travel data

Los Angeles Metro Transit Agency
• 2% of transit riders skate to reach transit stops
• Extrapolates to ~30,000 trips a day

Portland, Oregon
• Observers found skateboarders passing through 79% of intersections
  • East Portland: 5% of wheeled non-motorized travelers are skateboarders
So, skateboard travelers exist...

- Travel behavior
  - Why do people skateboard for travel?

- Planning Implications
  - Traffic Regulations
  - Safety
  - Appropriate Facilities
Skateboarder travel behavior
Why choose a particular travel mode?

Some broad hypotheses...

It meets travel preferences...
Skateboarding is the mode that best meets some individuals travel needs and goals for a given trip

It’s a rare, illogical act...
Skateboard travel is an irrational decision reflecting subversive, countercultural, or anarchic behavior
Skateboard commuter interviews

• 30 interviews with UC Davis skateboard commuters

• Interviewees recruited through...
  • Invitations to participate to skateboarders in UC Davis Campus Travel survey
  • Flyers/word of mouth advertising
  • Snowball sampling

• 30-45 minute conversations on experiences and perceptions of skateboarding, travel preferences
Supplementary questionnaire/survey

- Interviewees also given short written questionnaire
  - Additional detail on travel experience
  - Likert-scale questions on preferences/perceptions

- Some questionnaire items repeated in the 2012/2014 UC Davis Campus Travel Survey
<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6%</td>
<td>of students report skateboarding at least sometimes to or around campus</td>
<td></td>
</tr>
<tr>
<td>4.1%</td>
<td>of undergraduates are skateboard travelers</td>
<td></td>
</tr>
<tr>
<td>1,100</td>
<td>extrapolated number of skateboarder travelers</td>
<td></td>
</tr>
<tr>
<td>93%</td>
<td>male</td>
<td></td>
</tr>
<tr>
<td>10.2%</td>
<td>Consider skateboard an “available option” for commutes (Including 17% of men, 7% of women)</td>
<td></td>
</tr>
</tbody>
</table>

UC Davis Campus Travel Survey (2014)
Most have several years of experience

• Skateboard commuters aren’t picking up skateboard travel out of thin air
  • Already know how to skateboard
  • May already have skateboards

• Vast majority (97%) have recreational skateboarding experience

<table>
<thead>
<tr>
<th>Skateboarding experience</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than one year</td>
<td>6%</td>
</tr>
<tr>
<td>1-2 years</td>
<td>16%</td>
</tr>
<tr>
<td>2-4 years</td>
<td>18%</td>
</tr>
<tr>
<td>More than 4 years</td>
<td>60%</td>
</tr>
</tbody>
</table>

Average experience (yrs.) 6.5

<table>
<thead>
<tr>
<th>Age started skateboarding</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average starting age</td>
<td>13.8</td>
</tr>
<tr>
<td>Youngest starting age</td>
<td>7</td>
</tr>
<tr>
<td>Oldest starting age</td>
<td>27</td>
</tr>
<tr>
<td>Most common starting age</td>
<td>12</td>
</tr>
</tbody>
</table>
Majority also have past travel experience

• 60% report past skateboard travel...

“Skateboarding is how I got around without my parents.”

“As kids, everyone was human powered, on a bike or a skateboard.”
Incidental travel while recreating

• Recreational skateboarders ride at formal skate parks or informal “skate spots”

• Often skateboard to go from spot to spot, meet up with friends

“As a kid, I might have skateboarded four or five miles in a day skateboarding for fun.”
Why skateboard commute now?
Reason #1: Enjoyment

“For me, it’s mostly because it’s fun”

Skateboarding is...

“Just relaxing on a nice day”

“A stress reliever”

“An outlet”

“I like the feeling of gliding”
Reason #1: Enjoyment

More fun than other modes...

“[I] don’t get that [fun] bicycling or walking.”

“You’re not hunched over like when on a bike.”

Can listen to music...

“When I want to jam, I skateboard”
Reason #1A: It’s convenient

• Skateboarders do not think they are sacrificing function for enjoyment:

  “I skateboard more for pleasure, but it’s still a convenient way to get around”

  “I skateboard more for convenience”
Pedestrian like flexibility...

Don’t have to “park” a skateboard – carry them in

Carry skateboards onto cars/transit for easy multimodal trips
...at near bicycle speeds

UCD campus speed observations

- Skateboarders (avg. 9.7 mph)
- Bicyclists (avg. 11.6 mph)
Cost

• Nice skateboards much cheaper than nice bikes

• Make (free in Davis) public transit more viable

• Makes distant free parking more viable
Cargo carrying ability

• Can wear a backpack

• Hands are free
  • Interviewees reported skateboarding for small grocery trips

• Caveat: Less experienced riders more cognizant of weight
## Perceptions of skateboarding convenience

<table>
<thead>
<tr>
<th>Convenience</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much faster than walking</td>
<td>23%</td>
<td>77%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not having to park is convenient</td>
<td>1%</td>
<td>31%</td>
<td>66%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inexpensive</td>
<td>2%</td>
<td>35%</td>
<td>61%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Almost as fast as bicycling</td>
<td>6%</td>
<td>16%</td>
<td>17%</td>
<td>38%</td>
<td>23%</td>
</tr>
<tr>
<td>Carrying when not in use is a hassle</td>
<td>17%</td>
<td>34%</td>
<td>17%</td>
<td>21%</td>
<td>10%</td>
</tr>
</tbody>
</table>

N = 78
Source: Interview questionnaire and 2014 UCD Campus Travel Survey

*Not surprising that people who choose to skateboard like it, but what do they like about it/how much do they like it?
<table>
<thead>
<tr>
<th>Agree or strongly agree</th>
<th>“Considering non-skateboarders”**¹</th>
<th>Active skateboard commuters²</th>
<th>Difference in attitudes, p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skateboarding is much faster than walking</td>
<td>88%</td>
<td>100%</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>Not having to park my skateboard, like a bike, is convenient</td>
<td>71%</td>
<td>97%</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>Skateboarding is a fun way to travel</td>
<td>78%</td>
<td>96%</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>Skateboarding is an inexpensive way to travel</td>
<td>88%</td>
<td>96%</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>Skateboarding is almost as fast as bicycling</td>
<td>28%</td>
<td>61%</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>Skateboarding for travel gives me a sense of accomplishment</td>
<td>29%</td>
<td>61%</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>Skateboarding is a safe way to travel</td>
<td>31%</td>
<td>60%</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>I know well what traffic laws apply to skateboarders</td>
<td>34%</td>
<td>46%</td>
<td>0.04*</td>
</tr>
<tr>
<td>Carrying my skateboard while not riding is a big hassle</td>
<td>56%</td>
<td>32%</td>
<td>&lt;.01**</td>
</tr>
</tbody>
</table>

“Considering non-skateboarders” are travelers who indicate skateboarding is an option for their trips, but do not actually do so
1 – 2014 UC Davis Campus Travel Survey (n = 170)
2 – 2014 UC Davis Campus Travel Survey and Interview Questionnaire (n = 78)

People who consider skateboarding but less positive about safety, speed benefits
Local environment also convenient

*Davis has...*

- Warm, dry climate
- Flat terrain
- Plentiful bicycle infrastructure

“Having bike lanes is ideal”

“We really benefit from the bike lobby”
Feel that it is not unsafe

- Unsurprisingly, those who have chosen to skateboard for travel don’t think it is unsafe

  Safety is “not at all a concern”
  If you fall, “you dust yourself off and roll along”
  Falls are bad “more for the embarrassment factor”

- Safety could be barrier to other potential users
Mode shift needs a catalyst

• Despite positive perceptions of skateboarding, and experience, not necessarily sufficient to trigger skateboard commuting

“I brought my skateboard [when I moved here], but didn’t think to commute on it.”
Catalyst: Seing others

“I saw other people doing it, I fell in love, and it became my main mode of transportation.”

“If I had gone to a different school that had a different culture towards skateboarding or alternative modes, I probably would not have thought to skateboard.”
Catalyst: Bike problems

• Four interviewees (13%) switched to skateboarding after their bicycles were stolen
  • Another switched after bike impounded

• Carrying skateboards in → security advantage
Theory of Routine Mode Choice Decisions (Schneider, 2013)

1) Awareness and Availability
(People must be aware of the mode and have it available as an option to travel to an activity)

2) Basic Safety and Security
(People seek a mode that they perceive to provide a basic level of safety from traffic collisions and security from crime)

3) Convenience and Cost
(People seek a mode that will get them to an activity using an acceptable amount of time, effort, and money)

4) Enjoyment
(People seek a mode that provides personal (e.g. physical, mental, or emotional), social, or environmental benefits)

5) Habit
(People who choose a particular mode regularly are more likely to consider it as an option in the future)

Skateboard?
Barriers to skateboard travel
Trip Constraints

• Distance/time willing to travel
  • Maximum one-way trip willing to skateboard: 5 miles or 30 minutes (median questionnaire response)

• Carrying a lot of cargo

• Nice clothes/business attire
Weather

• Like other non-motorized modes, extreme weather can be a barrier

• Rain biggest annoyance:

  “Rain is my nemesis”

  Rain is a “no go” condition

• Concern over rusted bearings, carrying wet board around
When parking is necessary

What if you can’t carry skateboard into your destination?
Anti-skateboarding laws

• Schneider (2013) behavior model: 1st step – awareness/availability

• In many places, skateboarding not “available” because it’s not legal
Skateboarding traffic regulations
California state regulations

CVC 467

(a) A “pedestrian” is a person who is afoot or who is using any of the following:

• (1) A means of conveyance propelled by human power other than a bicycle.

• (2) An electric personal assistive mobility device.

Skateboarders have default legal standing as pedestrians
Oregon state regulations

OVC 801.385. “Pedestrian”

“Pedestrian” means any person afoot or confined in a wheelchair.

OVC 801.150. “Bicycle”

• (1) Is designed to be operated on the ground on wheels;
• (2) Has a seat or saddle for use of the rider;
• (3) Is designed to travel with not more than three wheels in contact with the ground;
• (4) Is propelled exclusively by human power;
• (5) Has every wheel more than 14” in diameter or two tandem wheels either of which is more than 14” in diameter.

Skateboarders have no default legal standing
Local regulations: Review of 60 cities in CA

- 85 percent have some skateboard prohibitions

  *Examples*
  - All roads (13%)
  - Some sidewalks (35%)
  - All commercial districts (6.7%)
  - Some commercial areas (40%)
  - In whole districts (23.3%)
  - At night (5%)
  - Some types on Sundays (1 city)

Prohibitions can prevent recreational skateboarding in certain situations, but make certain travel illegal.
## College Campus Regulations

<table>
<thead>
<tr>
<th>Skateboarding allowed (8)</th>
<th>University of California system (6)</th>
<th>California State University system (11)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Berkeley</td>
<td>Fresno</td>
</tr>
<tr>
<td></td>
<td>Davis</td>
<td>San Jose</td>
</tr>
<tr>
<td></td>
<td>Los Angeles</td>
<td>Sonoma</td>
</tr>
<tr>
<td></td>
<td>Riverside</td>
<td></td>
</tr>
<tr>
<td></td>
<td>San Diego</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skateboarding prohibited (8)</th>
<th></th>
<th>Chico</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Fullerton</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Los Angeles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long Beach</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sacramento</td>
</tr>
<tr>
<td></td>
<td></td>
<td>San Diego</td>
</tr>
<tr>
<td></td>
<td></td>
<td>San Francisco</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poly-San Luis Obispo</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Partial allowance/prohibition (1)</th>
<th>Irvine</th>
</tr>
</thead>
</table>

*Why more bans at CSU... more in a minute...*
Reasoning for regulations: Damage

• Worry that recreational skateboarders will grind on objects, leave scuff marks, damage edges

Is this a worry with skateboard travel?
Skateboard travelers don’t/can’t do tricks

• Observations: Skateboard travelers simply travel
  • Not popping tricks as they go along...

• Most skateboard travelers do not ride the same skateboards used in trick-riding
  • Ride longboards
  • Easier to cruise on, tricks harder if not impossible

Conventional (Trick) Skateboards

Longboards

Longboards have longer decks, bigger & softer wheels, lack kicktails (levers which manipulate board vertically)
Reasoning for regulations: Undesirability

Skateboarding is a public nuisance
- City of Highland Municipal Code

Elderly complain about “aggressive and abusive” behavior
- City of Rancho Cordova Municipal Code

Skateboarding is a low priority crime, but it escalates.
- Police Chief, San Diego State Univ.
Reasoning: Fear of safety

Skateboarding is a hazardous condition that presents imminent risk to riders and others.

- City of Highland Municipal Code
Skateboarding and safety...

<table>
<thead>
<tr>
<th>National Electronic Injury Surveillance System data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(ER visits as a result of use of consumer products)</td>
<td></td>
</tr>
<tr>
<td><strong>729</strong> Skateboard-related injuries on streets and other public property (2013)</td>
<td></td>
</tr>
<tr>
<td><strong>6</strong> Injuries to non-skateboarders*</td>
<td></td>
</tr>
<tr>
<td><strong>0.82%</strong> Injuries to non-skateboarders*</td>
<td></td>
</tr>
</tbody>
</table>

*From skateboards being ridden (vs. as inanimate object)

Can skateboarders injure others? Yes.
Common/often results in ER visits? Doesn’t appear so.
Why does CSU have more skate bans?

• Professor at Chico State in late 1980s struck and injured while walking on campus

• CSU Vice President asks campuses to review transportation policies, many banned skateboarding

Professor was hit by a bike
Were bicyclists banned, too?
Skateboarders are vulnerable road users, though

**US skateboard fatalities (at minimum, review of media reports)**

**2013: 21 fatalities**
- Vehicle strikes: 11
- On-road: 20
- During travel: 10
- During recreation: 11
- At skate park: 0

**2012: 30 fatalities**
- Vehicle strikes: 24

**2011: 42 fatalities**
- Vehicle strikes: 29

Most fatalities by state: California (32), New York (8), Texas (6), Virginia (5)

Summary by Skateboarders for Public Skateparks
Fatalities per 100 million miles traveled, California

- Cars: 2.6
- Bicycles: 11.3
- Skateboards: 18.9
- Pedestrians: 19.3

*Transportation deaths involving vehicle collisions
Calculated from US Fatality Analysis Reporting System (2013) and California Household Travel Survey (2012) data

Is this reason enough to prohibit skateboarding?

“If the purpose of passing this motion is to protect people from preventable injury, then I wonder whether a motion to ban athletics would be forthcoming.”

- San Diego State Academic Senator, discussing proposed skate ban
Skateboard regulations and consistency?

• Are other activities regulated based on perceptions of its participants?

• Are other travel modes only allowed on roads if proven they are not dangerous to users or bystanders?
Skateboard planning. Where should they go?
Speed differential

Travel speeds...

- 25+ km/h for cars
- 11.6 km/h for bicycles
- 9.7 km/h for pedestrians
- 3.4 km/h for skateboards

Knoblauch, Pietruchca, and Kitzburg, 1996

Bicycle facilities might be ideal

Speed differential with pedestrians and cars too high?
(We do let bicycles and cars mix, and bicycle/pedestrian mixed-use paths exist)
### What facilities do skateboarders prefer?

<table>
<thead>
<tr>
<th>Facility</th>
<th>1 - Not at all comfortable</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 - Very comfortable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-street bicycle path</td>
<td>4%</td>
<td>9%</td>
<td>6%</td>
<td>81%</td>
<td></td>
</tr>
<tr>
<td>Quiet neighborhood street</td>
<td>9%</td>
<td>4%</td>
<td>87%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-lane street with a bike lane</td>
<td>4%</td>
<td>43%</td>
<td>53%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-lane street, no bike lane</td>
<td>13%</td>
<td>27%</td>
<td>21%</td>
<td>26%</td>
<td>13%</td>
</tr>
<tr>
<td>Four-lane street with a bike lane</td>
<td>1%</td>
<td>27%</td>
<td>43%</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>Four lane street, no bike lane</td>
<td>30%</td>
<td>7%</td>
<td>31%</td>
<td>23%</td>
<td>9%</td>
</tr>
<tr>
<td>Empty sidewalk</td>
<td>31%</td>
<td>69%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sidewalk with few pedestrians</td>
<td>19%</td>
<td>16%</td>
<td>31%</td>
<td>34%</td>
<td></td>
</tr>
<tr>
<td>Crowded sidewalk</td>
<td>38%</td>
<td>10%</td>
<td>30%</td>
<td>9%</td>
<td>13%</td>
</tr>
</tbody>
</table>

1 - Not at all comfortable  
2  
3  
4  
5 - Very comfortable
Skateboarders care a lot about pavement

Skateboards have small, hard wheels.

“The smallest rock can make you look like the biggest jackass” – Focus group participant, Walker (2013)
High traffic suburban roads with few pedestrians? Sidewalks probably make most sense.

Busy downtowns with many pedestrians? Probably not sidewalks. Bike lanes probably best? Low speed streets?

Low traffic local streets. Why not?

Hard to say skateboarders should always or never go on a certain facility.
Portland Skateboard Ordinance (2000)

- Pre-existing “legal no-mans land” with no vehicle code status (Thomas, nd)

- Allowed skateboarders on streets and sidewalks, except downtown sidewalks

- Gave skateboarders similar rights to bicyclists while on roads

- Designated preferred skate routes
Get too formal with facility designations?

UC Santa Barbara
- Pedestrian paths
- Dedicated bike lanes
  - Skateboards never allowed
- Dedicated skateboard lanes
  - Must use where available
  - Otherwise use ped. paths

What happens when a unicyclist shows up?
(They ruled him a skateboarder)

https://thebottomline.as.ucsb.edu/2013/02/unicycling-student-wheels-and-deals-against-bicycle-citation
Behavioral restrictions

RESPECT YOUR RIDE AND UC RIVERSIDE

SKATEBOARDERS AND BICYCLISTS:

- Your wheels are welcome here
- Help keep our campus safe and undamaged
- Slow down for pedestrians
- Keep your wheels on the ground - tricks and stunts are not permitted on UCR property

For more details of UCR's reckless skateboarding/bicycle use policy, go online to basapps.ucr.edu under UCR policies and procedures, section 850.
Behavioral restrictions

1. Always yield to pedestrians.
2. Drive an appropriate speed according to existing conditions, not to exceed campus speed limit of 5 mph.
3. Drive in an appropriate manner that does not interfere with pedestrian or vehicular traffic.
4. Walk vehicle when there is no clear path ahead,
5. Do not ride in an acrobatic or stunting manner (activities causing 1+ sets of wheels to leave the ground)
6. Do not ride on stairs; ramps, railings, vegetation, benches, tables, planters, or other surface not intended for vehicular travel.
7. Do not ride inside University buildings.
8. Dismount and walk vehicle where appropriate signs are posted (in affect 8am-4pm Monday-Friday).
Conclusions
Skateboarders are people, too...

- Travel behavior can be characterized using the same theory as other travelers.
- Skateboard travel is a result of rational decision making process.
- Skateboarders influenced by similar factors that affect pedestrians and bicyclists.
Planning Implications

• Skateboarding amenable to multimodal trips

• Could be another user/justification for bicycle infrastructure

• Skateboard travelers face inconsistent (and probably irrational) regulations

Skateboarder illegally taking advantage of a bike lane at San Diego State
“Complete Streets” Movement

• Perspective that transportation planning should meet the needs of all travelers, regardless of mode

Does complete streets thinking apply to skateboarders, too... or no...

A “complete street” in York, England?
#BREAKINGNEWS: People Skate to Work

By Lucas Wisenthal  27 Oct, 2014

In today's edition of am New York, writer Dan Rivoli explores alternative means of getting to work and makes an astounding discovery: People in New York skate to the office.
Walk Bike or Roll to school

A great way to start your day

Developed by California Active Communities, Safe Routes to School Technical Assistance Resource Center. For more information visit www.CAsafesroutestoschool.org
Other emerging “esoteric” travel modes?

- Kick scooters/ Electric scooters
- Electric skateboards
- Onewheel
- Solowheel
State Assembly Minority Leader Kristin Olsen (R-Modesto)

- Successfully introduced legislation legalizing electric skateboards on roads where bicycles are allowed
- Planning implications?
Thank you! Questions...

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