Sacramento State Olli Experience – AV Perception, Opportunities, and Challenges

By
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California State University, Sacramento
Outline

• Background and Introduction

• The Olli Experience at Sacramento State

• Results of Student Survey
Background and Introduction

- Sacramento State
  - Greater than 40,000 students, faculty, and staff
  - Approx. 13,000 vehicles arriving on campus (based on parking permit data)

- Challenge: to diversify the mode share and promote alternative modes of transportation

- Reduce congestion and carbon footprint
  - University goal to reach full carbon neutrality by 2040

Source: Capradio.org
Background and Introduction

- **Opportunity**
  - Address the first/last mile problem

- **Campus connectivity to the Sac RT 65th street light rail station**

- **Approx. 150 – 200 passengers per day**

- **Avg. route time - 15 minutes**

- **Sometimes up to 30 – 40 minutes during congestion/peak semester times**
Background and Introduction

- **Idea**
  - Fixed route connection to the 65th St. light rail station through the “Hornet Tunnel”
  - Use AV to promote innovation and reduce carbon footprint
  - Discussions with the City of Sacramento and participation in the SACOG Civic Lab Project

- **Potential Outcomes**
  - Testing ground for autonomous, electric, and shared-vehicle technologies
  - Demonstrate the effectiveness of AV technology
  - Opportunity to learn about rider preferences and attitude towards AV
  - Safety - Interaction with vulnerable road users
  - Infrastructure needs and requirements
Local Motors - Olli Fleet Challenge

- Olli - Local Motors AV Shuttle
  - 3D printed electric AV
  - Seats 8 people
  - “Autonomous glass-topped toaster on wheels”

- Olli Fleet Challenge Competition
  - “What would you do with a fleet of AV?”
  - 3-month deployment - Multiple shuttles
  - $88,000 from SACOG
Local Motors - Olli Fleet Challenge

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Sacramento State – Olli Trial

- **Trial Route - Moraga Way – Spring 2019**
  - From near new Parking Structure 5 to Amador Hall
  - Approx. 0.3 miles one-way route
  - ADA Accessibility
  - Multiple stops along the route
Sacramento State – Olli Trial

- Olli Operation – Spring 2019
  - On-board steward
  - From 9:30 AM – 4:00 PM with a 1 hour break
  - Approx. 5 – 10 mph speed
Sacramento State – Olli Trial
Sacramento State – Olli Trial
Sacramento State – Olli Trial

- Olli Operation – Spring 2019
  - 992 total rides
  - Rider registration required for liability reasons
Olli Trial – Participant Survey

- 43 Survey Questions
- 122 participants

AV Survey Details
- General Participant Information
- General Use and Preferences Regarding AV
- Olli Specific Questions
- Olli Perception
- Overall Safety Perception
- Other Issues/Concerns with AV
Olli Trial – Participant Survey

Mode of Transportation

- Public transportation: 4%
- Carpool: 6%
- Car: 83%
- Bicycle: 4%
- Walk: 3%
Olli Trial – Participant Survey

**Time to walk from home to a nearest public transportation stop?**

- Not walkable: 6%
- More than 30 minutes: 10%
- Between 20 to 30 minutes: 2%
- Between 10 to 20 minutes: 16%
- Between 5 to 10 minutes: 32%
- Less than 5 minutes: 34%

**Public Transportation Use**

- Never: 59%
- At least once every few months: 25%
- At least once a month: 6%
- At least once a week: 7%
- At least once everyday: 3%
Olli Trial – Participant Survey

I felt completely normal riding in Olli Shuttle

- Strongly disagree: 2%
- Slightly disagree: 10%
- Neutral: 15%
- Slightly agree: 31%
- Strongly agree: 42%

Olli operates too slowly to be useful

- Strongly disagree: 15%
- Slightly disagree: 17%
- Neutral: 21%
- Slightly agree: 26%
- Strongly agree: 21%

I have concerns with the way Olli was operating while interacting with pedestrian, bicyclist, and other traffic

- Strongly disagree: 30%
- Slightly disagree: 21%
- Neutral: 23%
- Slightly agree: 20%
- Strongly agree: 7%
Olli Trial – Participant Survey

I felt comfortable with the way Olli accelerates

- Strongly disagree: 2%
- Slightly disagree: 12%
- Neutral: 20%
- Slightly agree: 29%
- Strongly agree: 36%

My concerns with the way Olli accelerates discourages me from using an autonomous vehicle

- Strongly disagree: 45%
- Slightly disagree: 31%
- Neutral: 12%
- Slightly agree: 9%
- Strongly agree: 4%

I felt comfortable with the way Olli decelerates/brakes

- Strongly disagree: 21%
- Slightly disagree: 22%
- Neutral: 16%
- Slightly agree: 23%
- Strongly agree: 18%

My concerns with the way Olli decelerates/brakes discourages me from using an autonomous vehicle

- Strongly disagree: 27%
- Slightly disagree: 24%
- Neutral: 16%
- Slightly agree: 25%
- Strongly agree: 8%
Olli Trial – Participant Survey

I trust that a driverless vehicle can drive without assistance

- Strongly disagree: 8%
- Slightly disagree: 18%
- Neutral: 18%
- Slightly agree: 33%
- Strongly agree: 22%

I would feel comfortable in a driverless vehicle with controls (wheel, gas or brake pedals)

- Strongly disagree: 25%
- Slightly disagree: 23%
- Neutral: 25%
- Slightly agree: 21%
- Strongly agree: 7%

I would not use a driverless vehicle because technology can sometimes fail

- Strongly disagree: 10%
- Slightly disagree: 24%
- Neutral: 18%
- Slightly agree: 34%
- Strongly agree: 14%
Olli Trial – Participant Survey

I would trust the driving skills of a driverless vehicle more than my own driving skills

- Strongly disagree: 33%
- Slightly disagree: 29%
- Neutral: 15%
- Slightly agree: 18%
- Strongly agree: 5%

A careful driver can prevent any accident on the road

- Strongly disagree: 45%
- Slightly disagree: 27%
- Neutral: 8%
- Slightly agree: 17%
- Strongly agree: 3%
Olli Trial – Participant Survey

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AV – Challenges and Opportunities

• Challenges
  – Short route, slow speeds
  – Novelty Factor
  – Dedicated routes for AV shuttles to improve mobility
  – “The loss of the joy of driving and the feeling of being in control”

• Opportunities
  – “A Classroom on Wheels”
  – Potential for AVs to serve the public transportation needs of local communities
  – Understanding user issues, factors, concerns, through real-world AV trials
  – Strategizing AV deployment opportunities

• Study Limitations
  – On-going research
  – Sample bias, e.g. age etc.
Acknowledgements

• James Corless and SACOG

• CSUS Academic Affairs

• CSUS University Transportation and Parking Services (UTAPS) Staff
Questions