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Crowdsourcing Cycling Safety and Route Data with the “ORcycle” Smartphone App

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TTP Lab

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ORcycle: Crowd-Sourcing Data Collection Improve Bicycle Transportation Planning and Safety

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ORcycle: Crowd-Sourcing Data Collection Improve Bicycle Transportation Planning and Safety

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Advantages Smartphone Apps

- Cost per respondent
  - Fixed and variable costs
  - Cost per record
- Data precision and quality
  - GPS
  - Q/A
- Revealed preference
- Panel data potential

Research Project Goals

- Pilot a cheaper and easier method to collect bicycle data
- Understand impacts of riding skills and personal characteristics on choices
- Quantify the underreporting of safety data (crashes &. near-misses)
- Learn where cyclists travel and their level of traffic and cycling stress

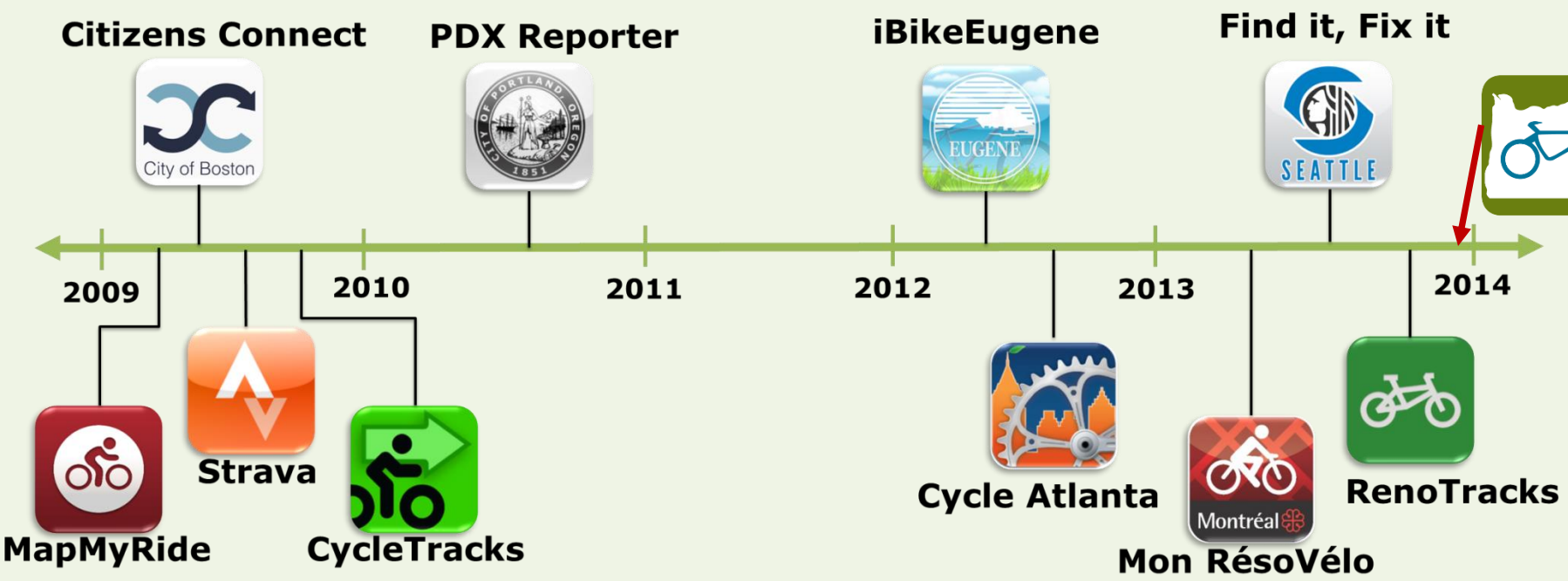
More context

- Oregon is the first state DOT to pilot a bicycle app

- Lane County utilizes a slightly modified version of CycleTracks (LaneTracks)

Related Apps Timeline

Infrastructure Crowdsourcing Apps



Transportation Planning Apps and Recreational Apps

Why a new app ?

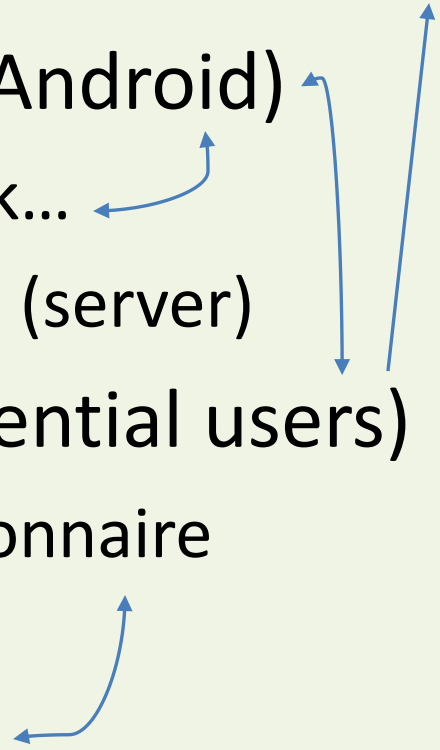
- **Emphasis on safety and infrastructure aspects**
  - New questionnaires and features
- Emphasis on cyclists' types
  - New questionnaires
- Answers with multiple choices and/or selections.
- Focus on new trip purposes and routes.
- Add reminders, useful info, and tutorials
  - Encourage utilization
  - More user friendly

ORcycle: 4 basic parts

- Record Trips
- Report Safety Issues
  - Crash or near-miss
  - Safety problem (e.g. uneven pavement)
- User Data
  - Biking habits and socio-demographic (optional)
- Links to maps and to report to ODOT
  - ORcycle is not a substitute for reporting to the agency that has jurisdiction

ORcycle Development – Part I

- Conceptual ideas and features
- Coding (iOS and Android)
  - Testing, feedback…
  - Coding back-end (server)
- Pilot testing (potential users)
  - Features, questionnaire
- Many Iterations
  - Data quality?
- Website development



We have the app… now, how do we reach users?

ORcycle

HELP MAKE YOUR COMMUNITY A SAFER PLACE TO RIDE

ORcycle is a smartphone app designed to provide feedback about bicycle routes, infrastructure and crashes/accidents. Your data and feedback will help improve bicycling in Oregon.

Who should participate? Everybody! Families, commuters, recreational, casual, and everyday riders.

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Sponsored By

Oregon Department of Transportation

Developed By

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http://www.pdx.edu/transportation-lab/

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Available Platforms

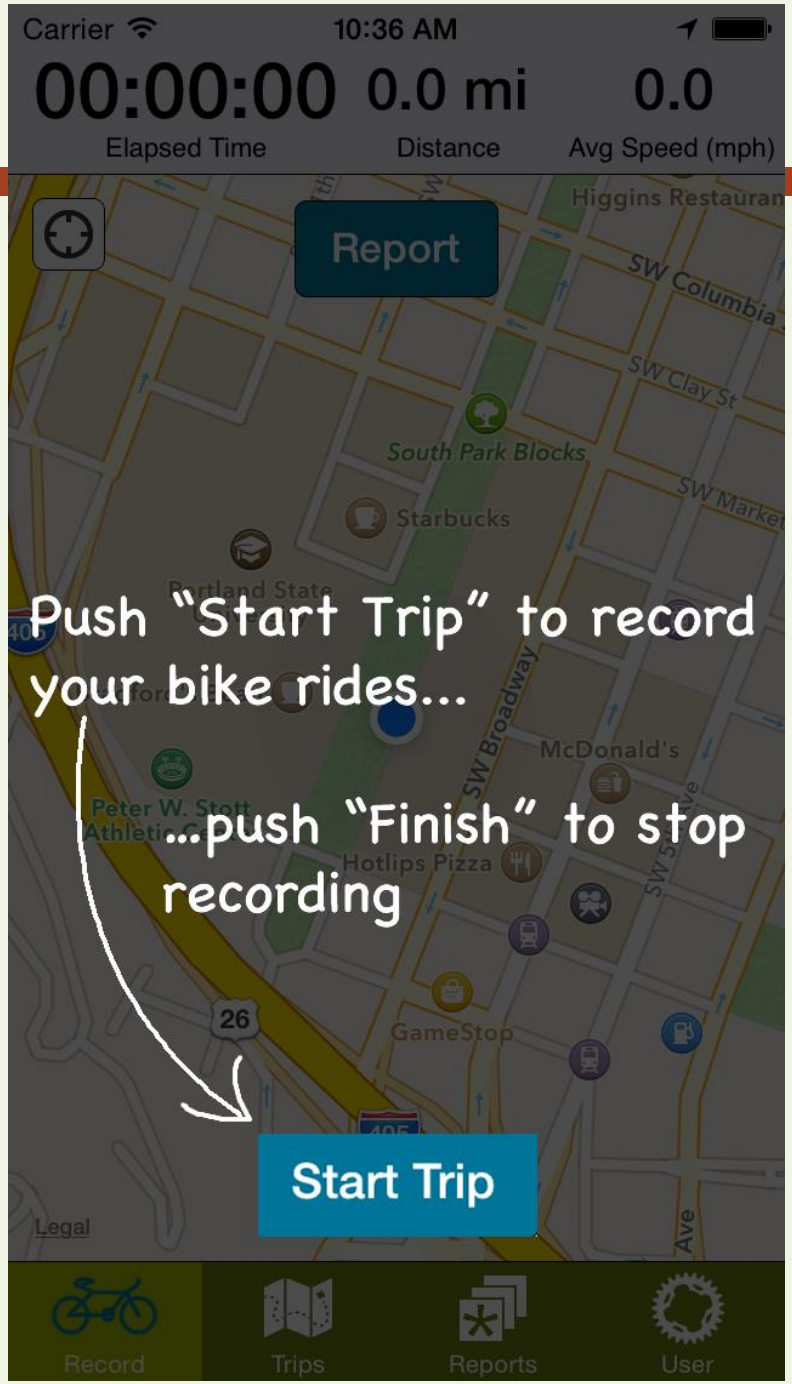
ORcycle Development – Part II

- Pilot Study: November and December 2014
- Users have questions and feedback
  - Respond to questions
- Website development and improvement
- Data validation and cleaning
- Mapping results
- Data analysis
- New version !

Tutorial

Questions after completing a trip:

- Purpose
- Frequency
- Route choice factors
- Comfort level
- Safety concerns? (optional)
- Additional comments? (optional)



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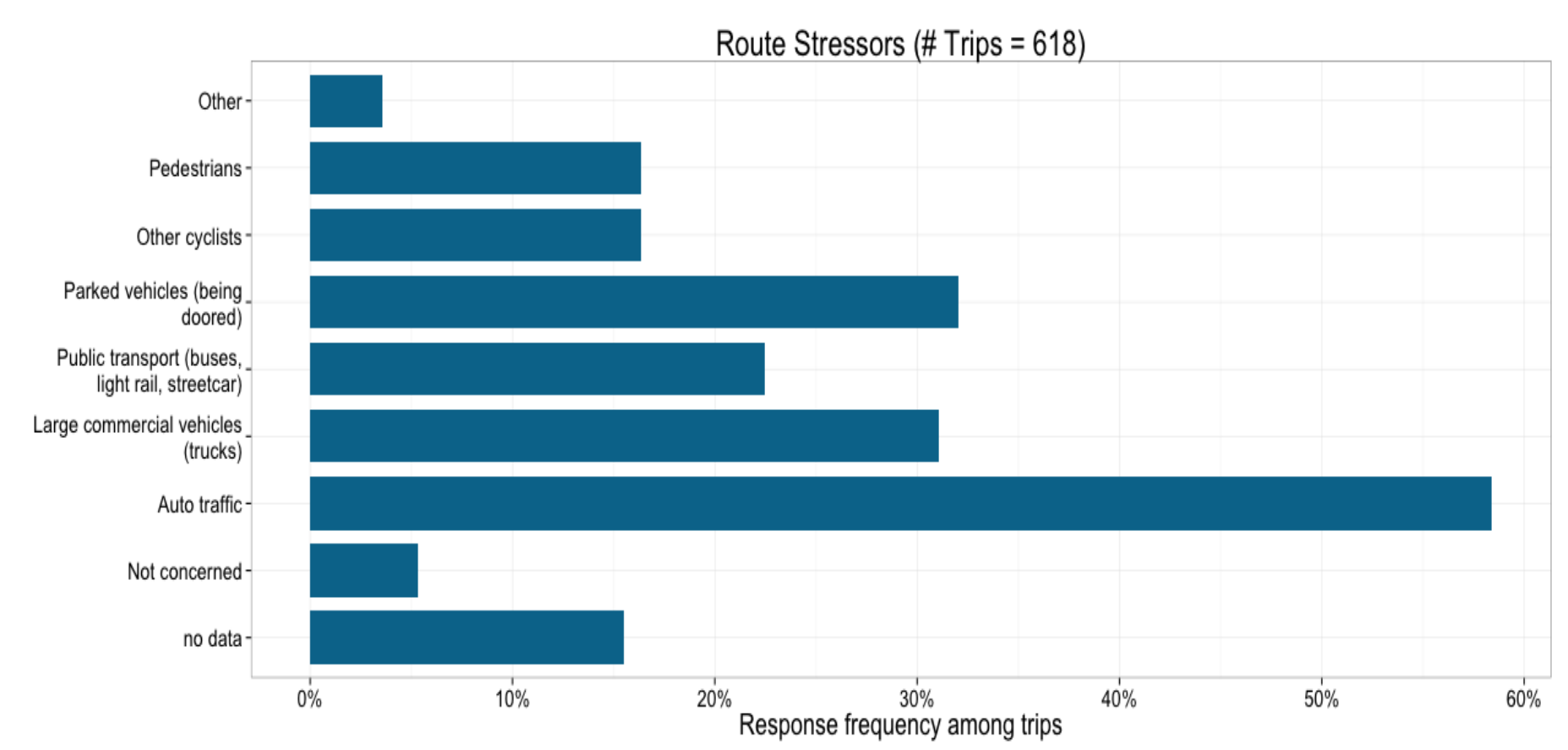
Trips


Route Stressors (# Trips = 618)
Other
Pedestrians
Other cyclists
Parked vehicles (being doored)
Public transport (buses, light rail, streetcar)
Large commercial vehicles (trucks)
Auto traffic
Not concerned
no data
0%
10%
20%
30%
40%
50%
60%
Response frequency among trips

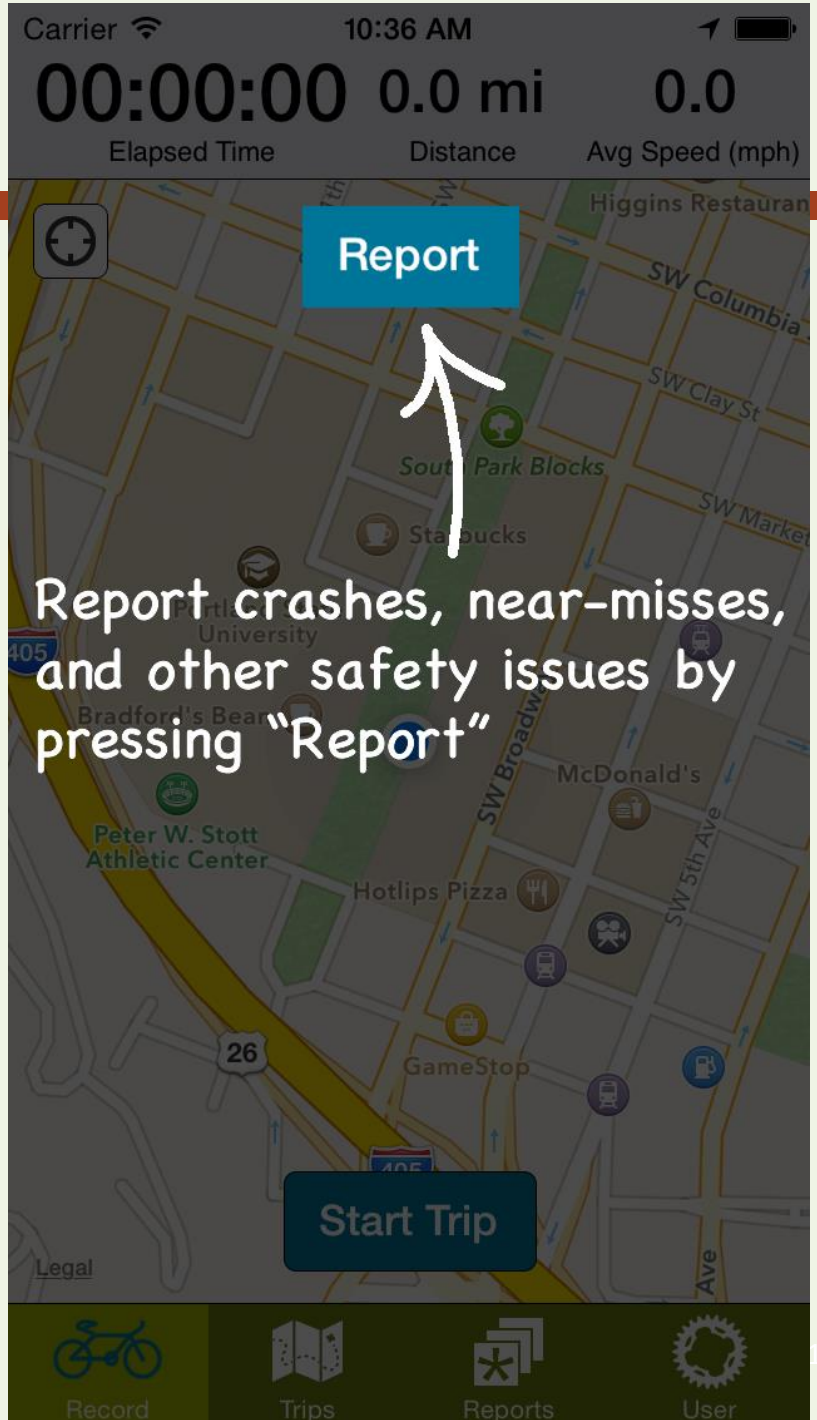
Tutorial

Questions after completing a crash report:

- Severity
- Object (vehicle)
- Actions that led to the event
- What contributed to the event
- Date
- Additional comments?

Questions after completing a safety report:

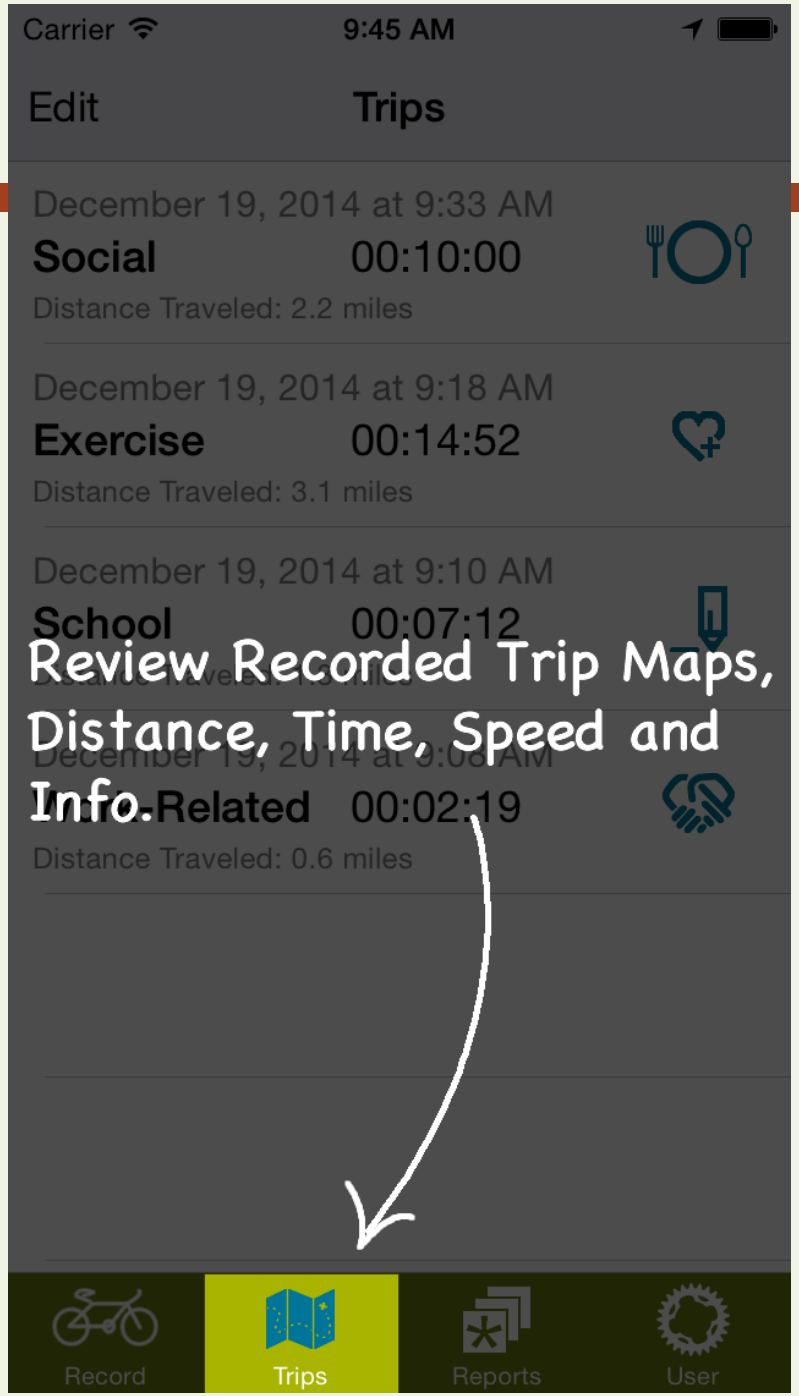
- Urgency
- Type of problem
- Date
- Additional comments?



Tutorial

User can review trips:

- Map
- Time, distance
- Questionnaire



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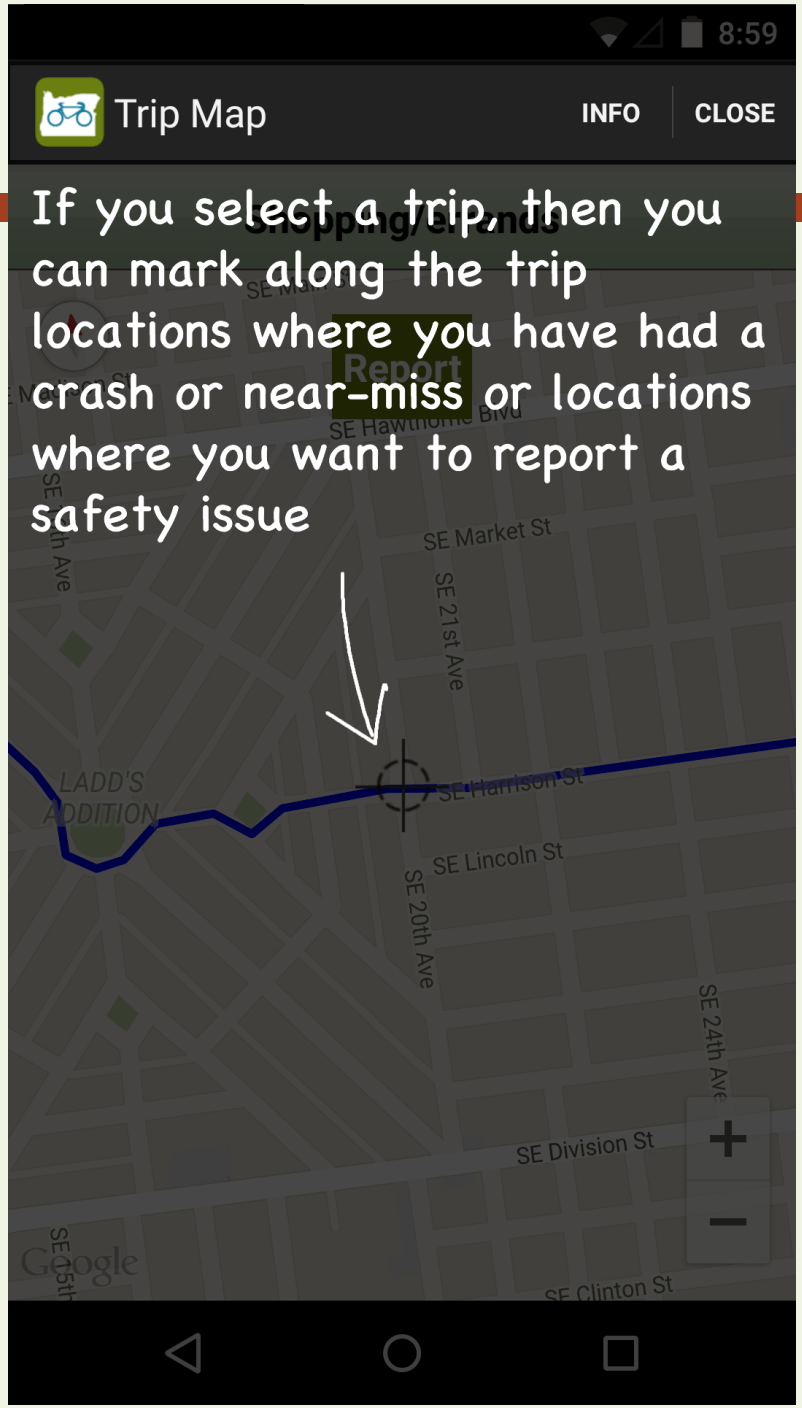
Tutorial

Added feature:

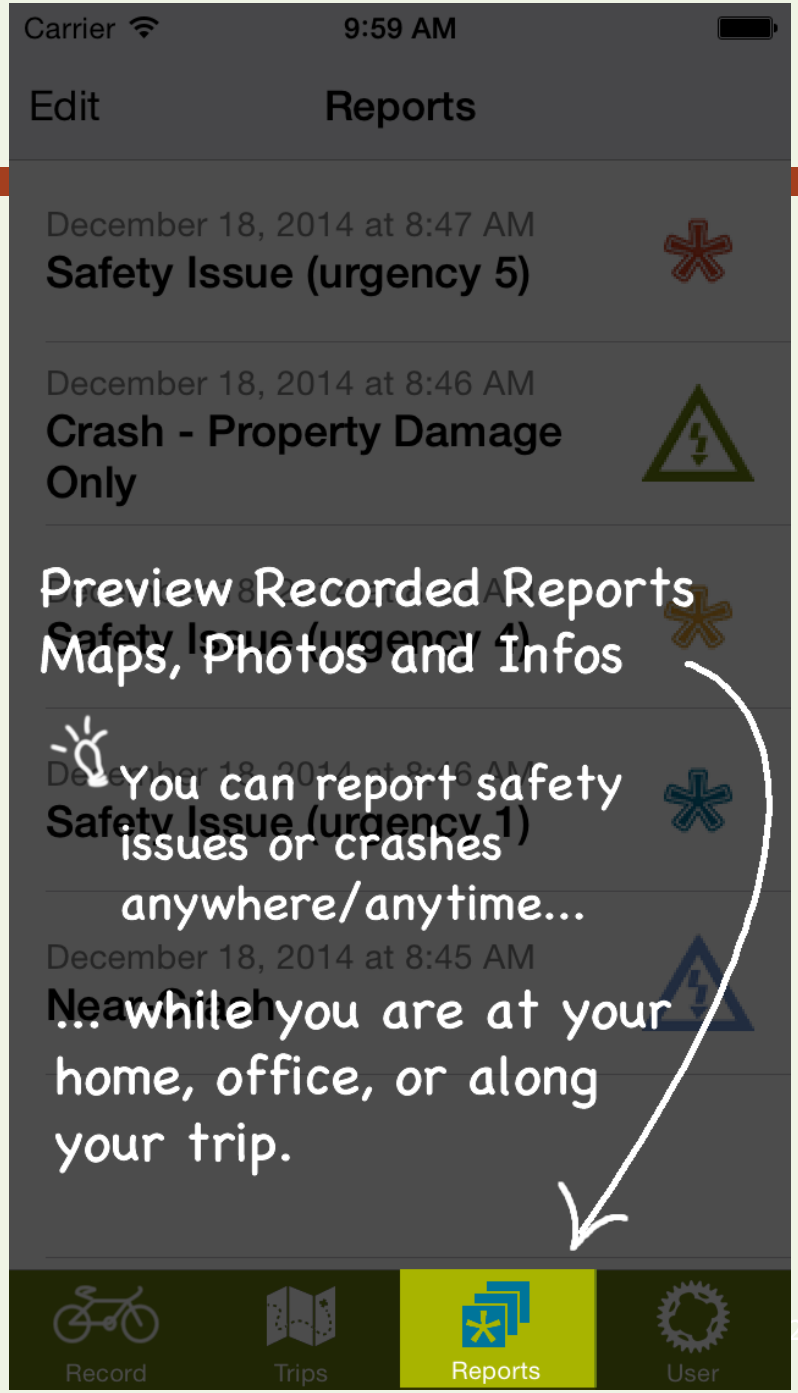
- Go back to your trip and select points along the route
- Only available for Android version



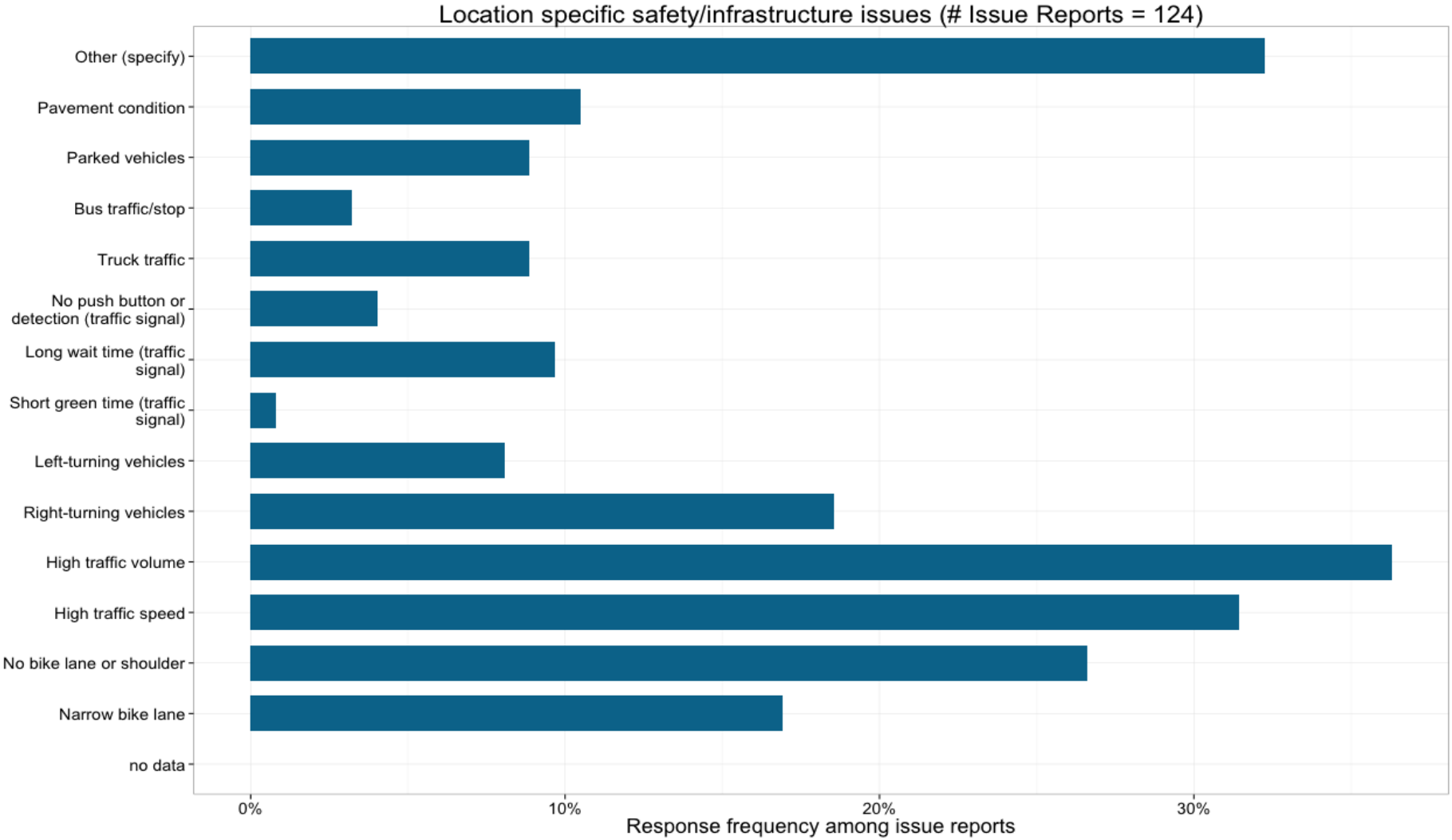
Tutorial

Color and shape coded
- safety/infrastructure issues (a star)
- crash or near-miss (a triangle)

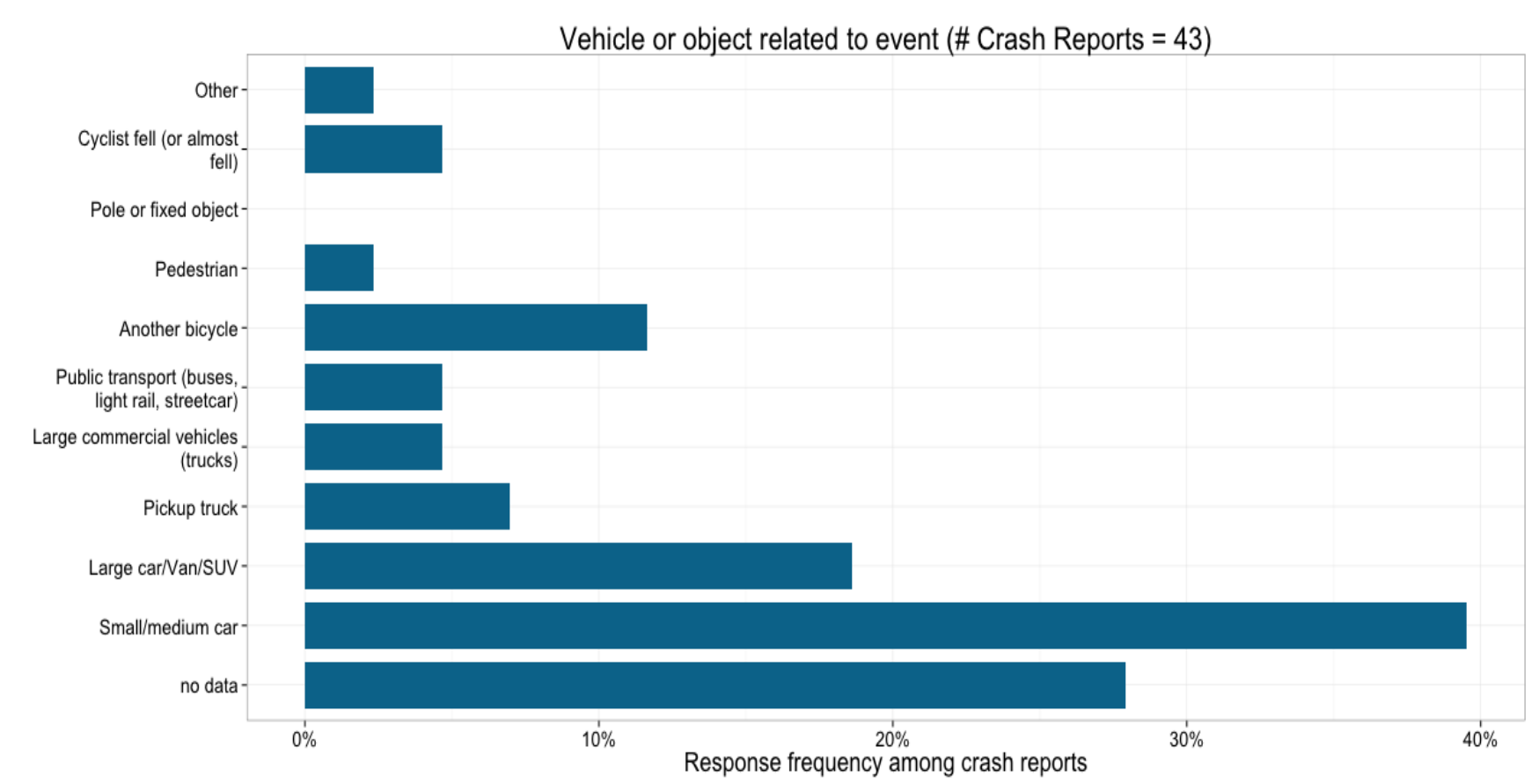
User can review report:
- Map
- Questionnaire



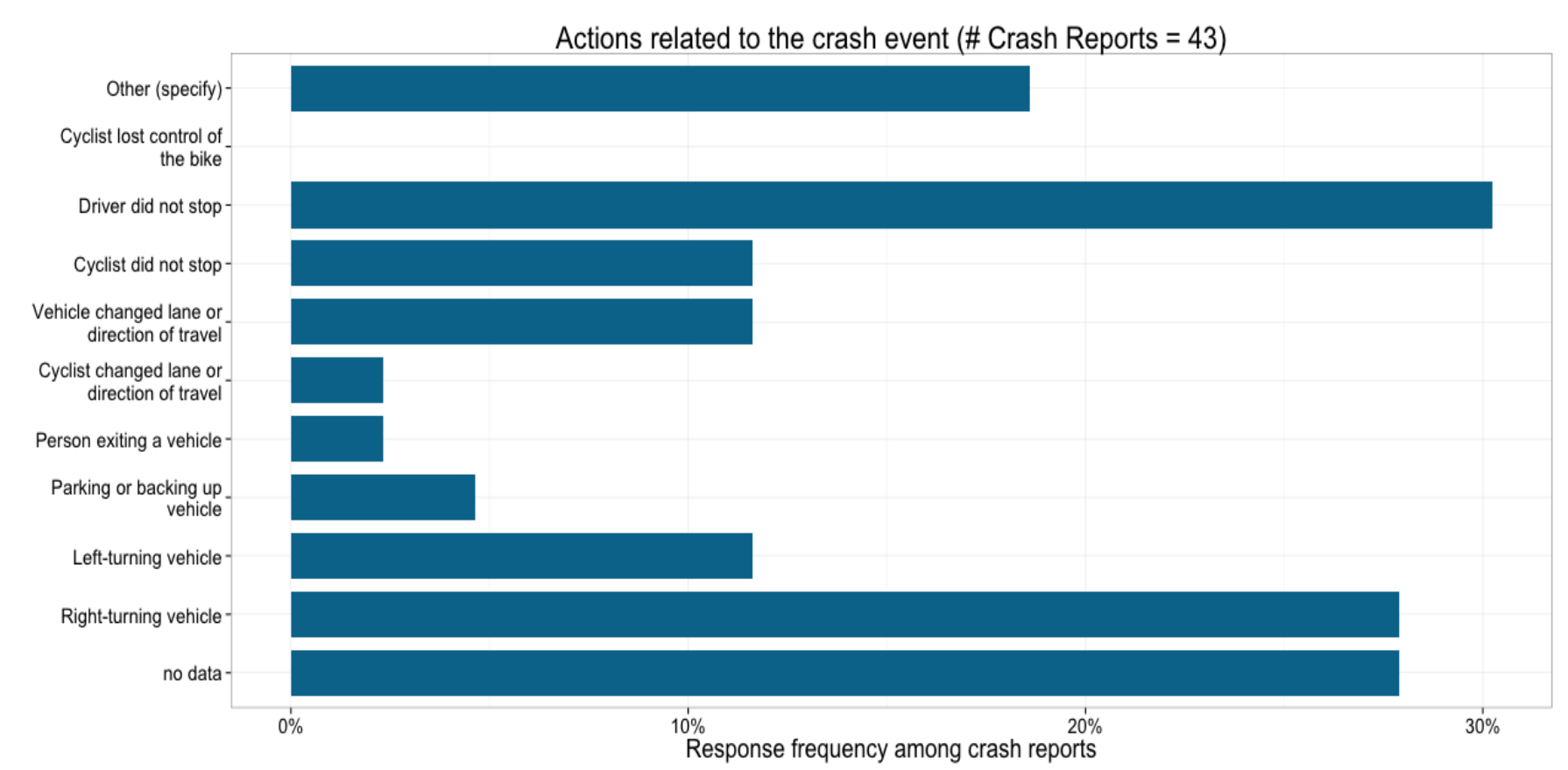
Safety/Infrastructure Reports



Crash Reports



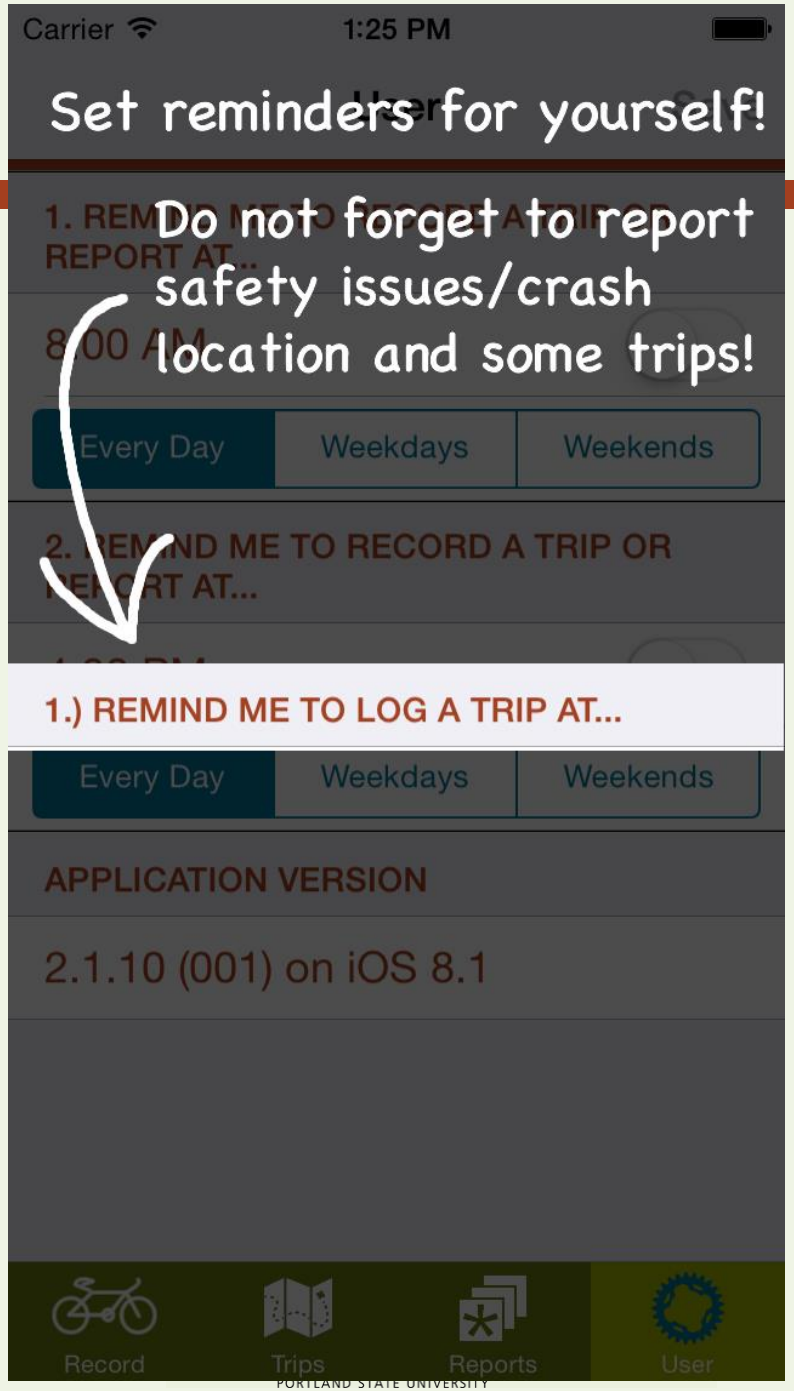
Crash Reports



Tutorial

Added feature:

- Reminders !



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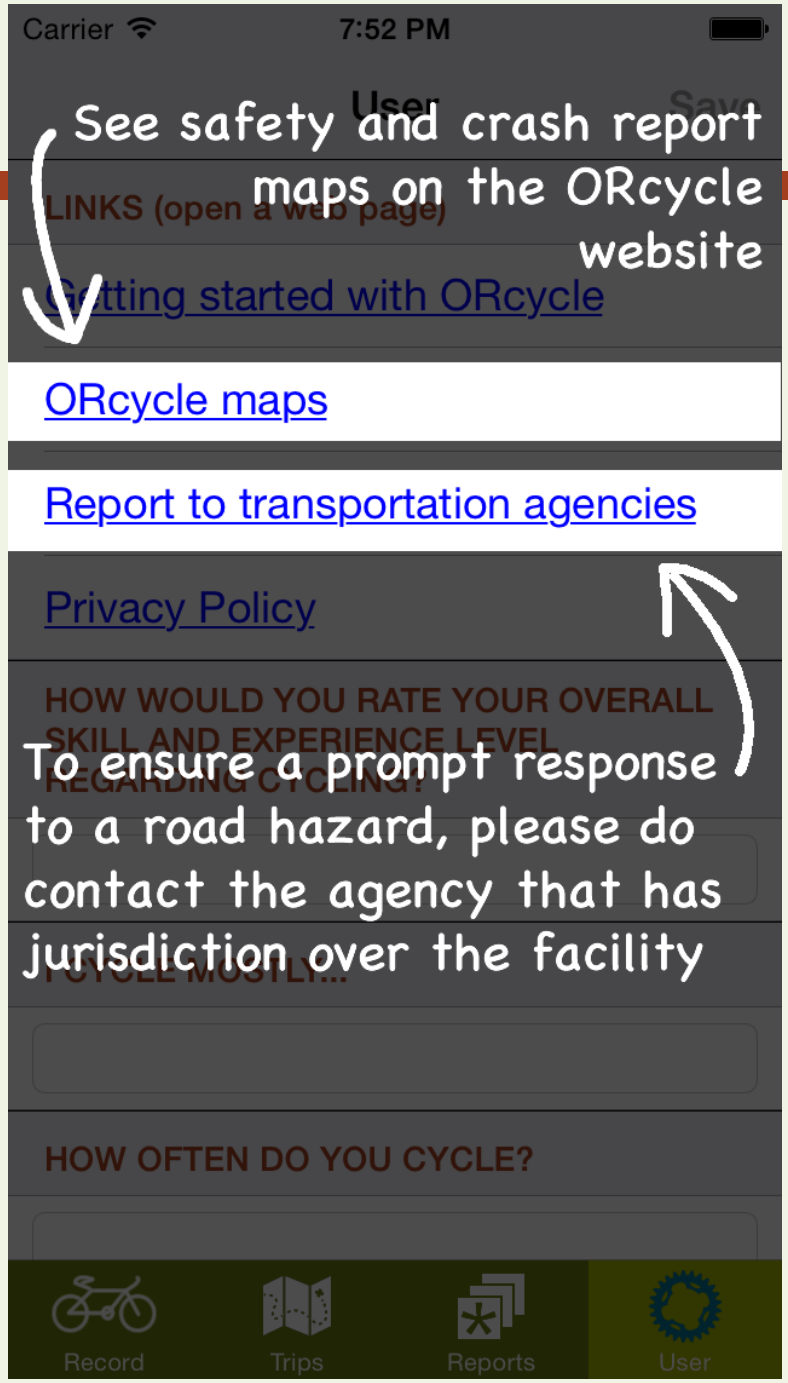
Tutorial

Added feature:

- Links to maps and to report to transportation agencies



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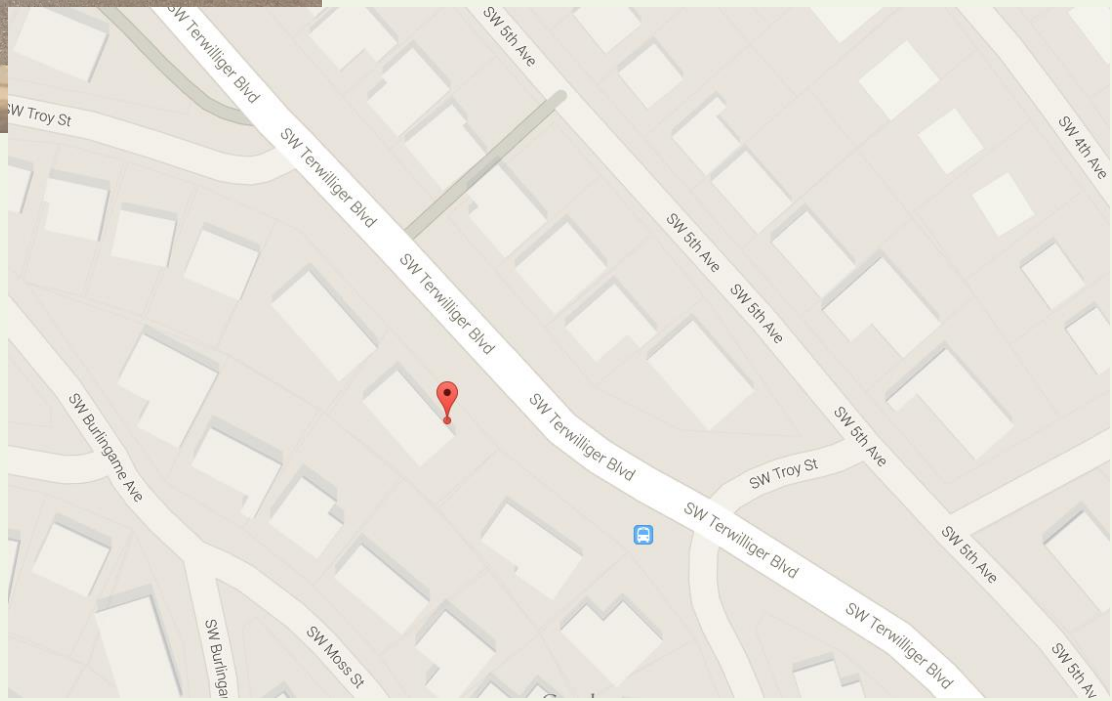
ORcycle Report Map

- Go to http://www.pdx.edu/transportation-lab/orcycle-maps
- Two layers: crash data and safety issues
- Show maps with trips: LINK

Value of comments and location

"Drivers use the bike lane as a right hand turn lane before entering the highway during morning rush hour (8-9 am). Makes it extremely dangerous for cyclists to pass, as they either are dodging traffic last minute or duking it out in the lane with angry reactions…"

Value of comments and location



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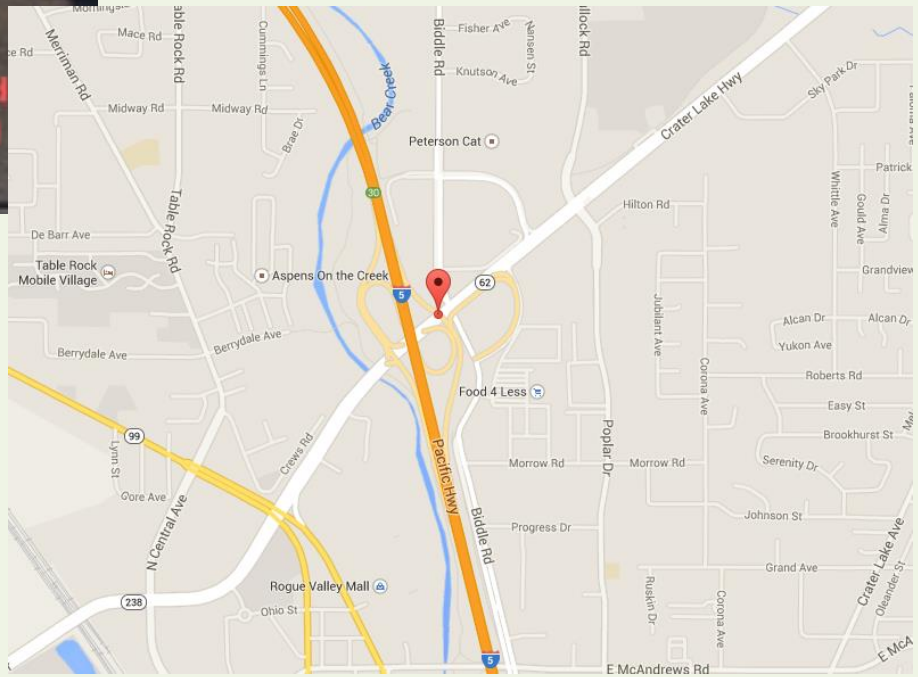
Value of comments and photos



North of Medford

Crater Lake Highway close to I-5 interchange

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2285 OR-62
Medford, Oregon
Street View - Apr 2012
CRATER LAKE HWY
OR-62


OR-62

Value of comments and photos

Right Turn Problems

Value of comments and photos

Blocked bike lanes or paths

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Value of comments and photos

Infrastructure Issues