NABSA Webinar: Shared E-Scooter Safety

June 25, 2019

NABSA

Your Presenters

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David Zane
Injury Epidemiologist, Austin Public Health

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Emergency Medicine Physician and Researcher, UCLA

Rachel Zack
Policy Strategist, Remix

Your Facilitator

Sam Herr
Executive Director, NABSA

Injuries Associated with Standing Electric Scooter Use

Santa Monica and Los Angeles, California, 2017-2018

Tarak Trivedi MD, MS

C. Liu MD, A. Antonio DrPH, N. Wheaton MD, V. Kreger MD, A. Yap MD
D. Schriger MD MPH, J. Elmore MD MPH

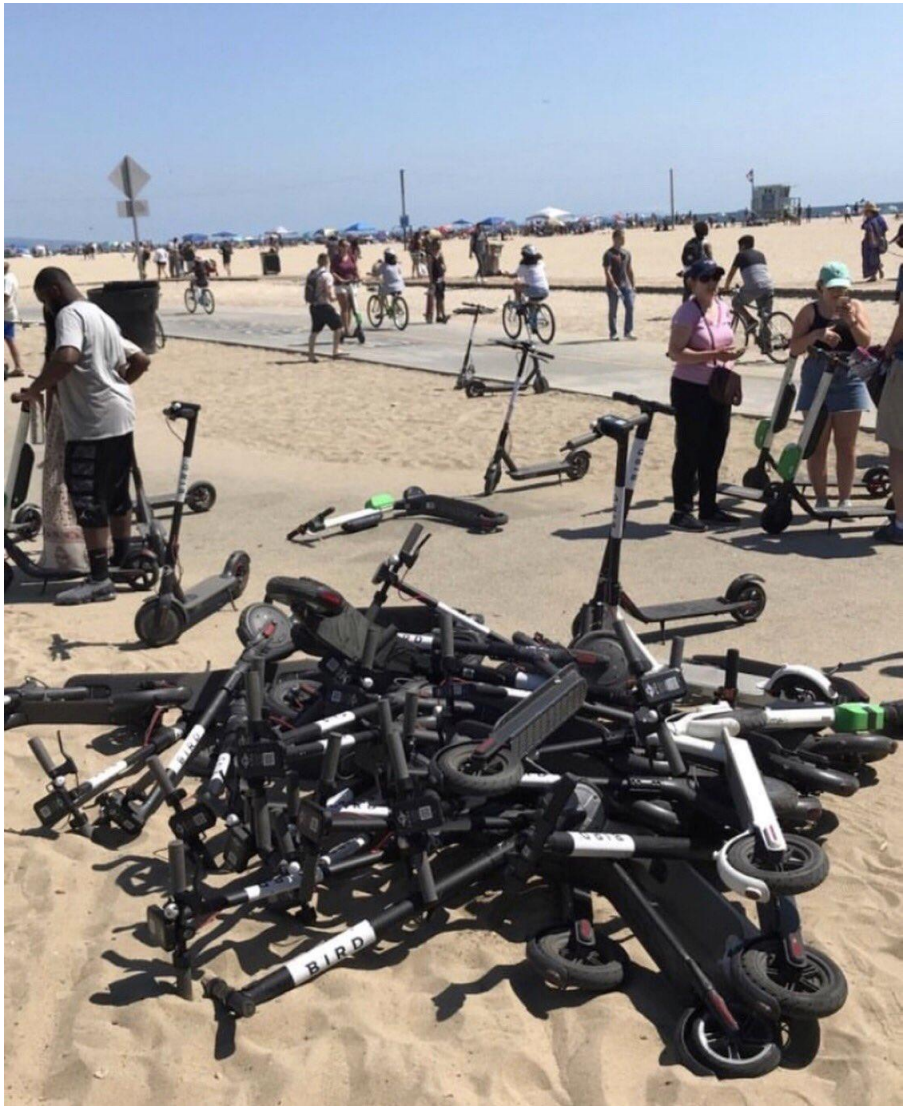
National Clinician Scholars Program / VA | U.S. Department of Veterans Affairs

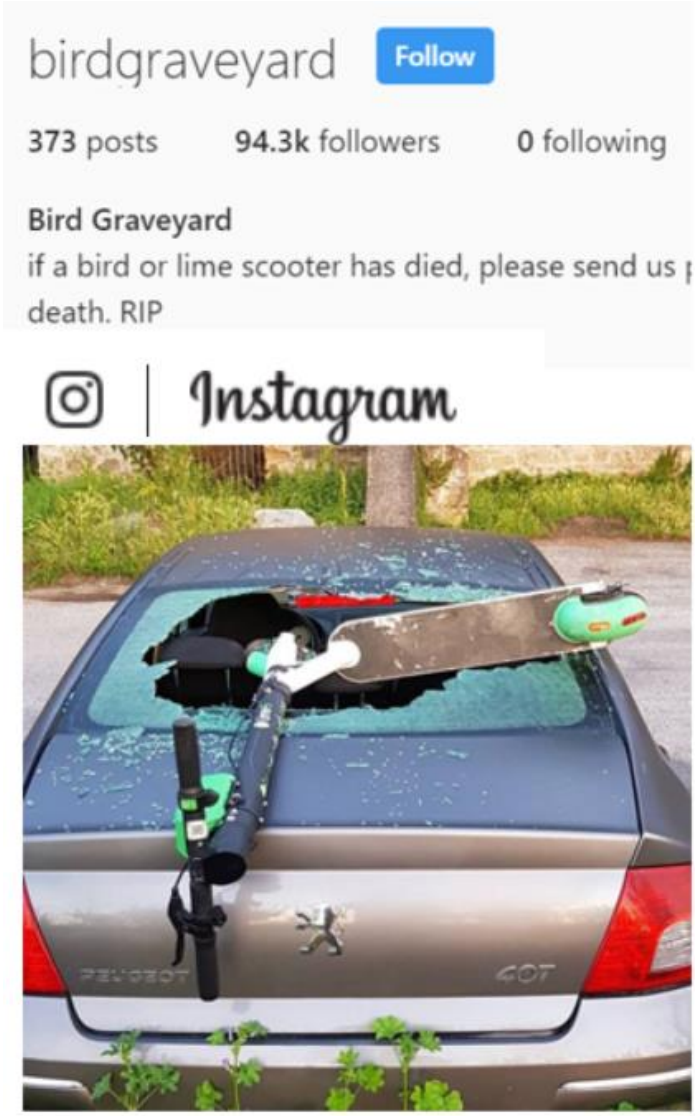
Standing Electric Scooters

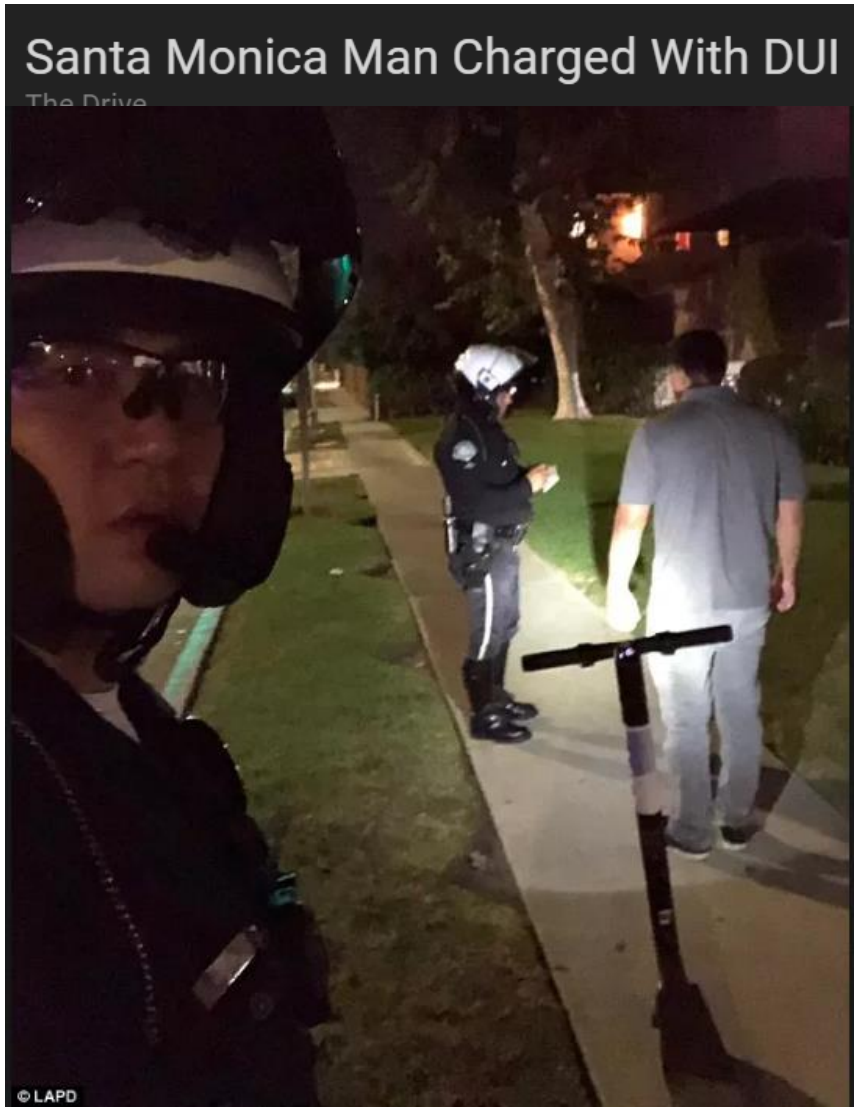
- Santa Monica: September 2017

Transforming Transportation

…with real challenges







Impetus and Aim

- Traumatic injuries, mild to severe
- Research opportunity due to location
- Policy actively changing without solid evidence base
  - California law passed making helmets optional for adults
- Aim: Characterize the types of patients and injuries associated with electric scooter use

Methods

- Text search of all ED encounter notes at 2 major hospitals in West LA County
  - Ronald Reagan Medical Center and Santa Monica Hospital
  - September 2017 - 2018
  - Searched for specific terms: “scooter”, “lime” , “bird”

- Case identification and full manual review of the charts determined to be electric scooter associated injuries

- 4 datasets merged
  - ED visit characteristics
  - Imaging tests ordered
  - Diagnosis codes
  - ED Physician and Nursing notes

Methods: Automating Case exclusion

- Used Stata programming to identify cases and exclude to limit charts needing manual review

- Examples
  - “thunderbird blvd”
  - “mobility scooter”
  - “slime”
  - “lime disease”

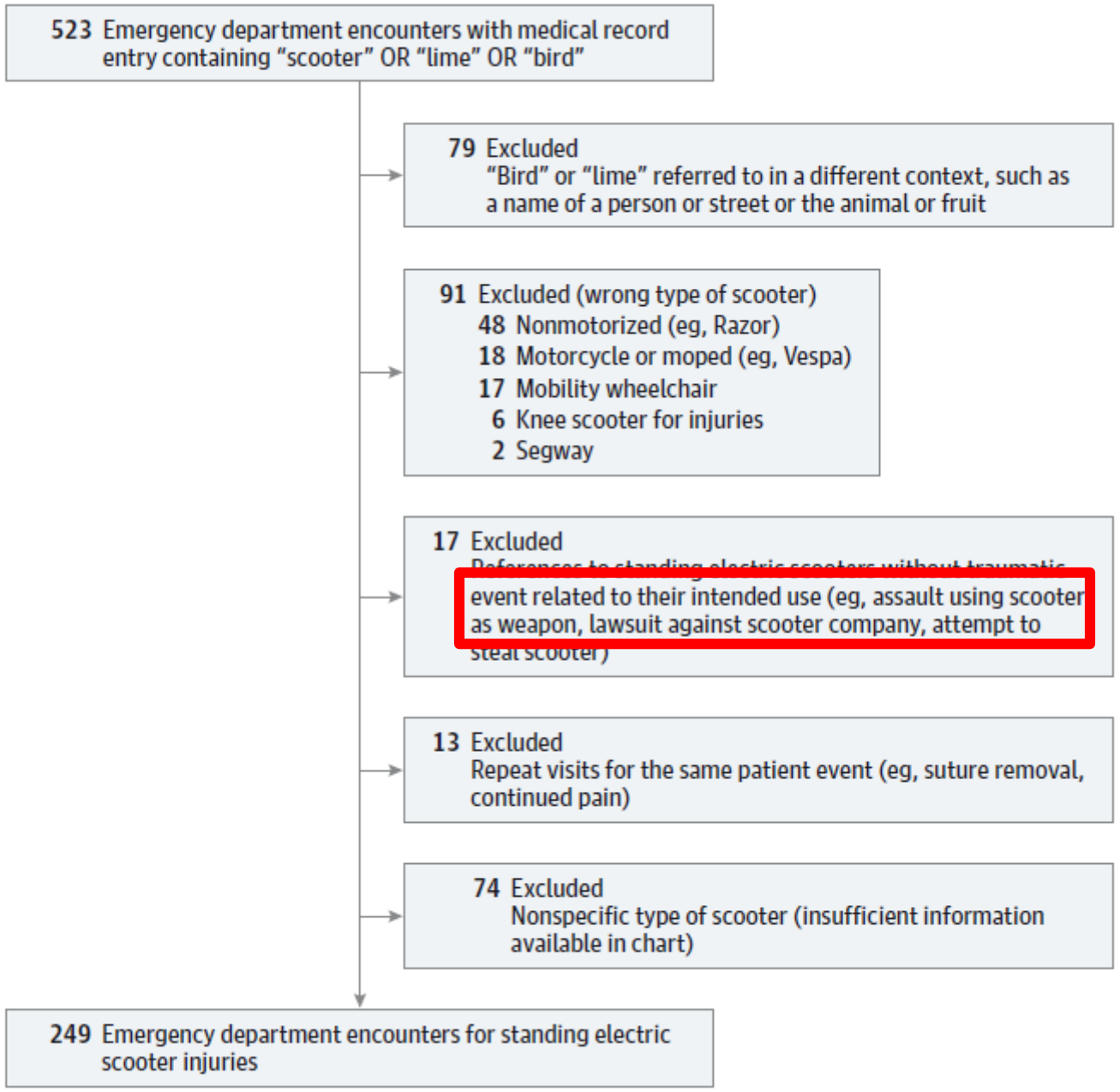
```
* Created shortned data to process
cap drop defyes
gen defyes=1 if is_bird_and_scooter==1
replace defyes=1 if is_lime_and_scooter==1
replace  defyes=0 if index(note_text, "thunderbird blvd")
replace  defyes=1 if index(note_text, "byrd scooter")
replace  defyes=0 if index(note_text, "mobility scooter") & defyes==.
replace  defyes=0 if index(note_text, "slime") & defyes==.
replace  defyes=1 if index(note_text, "riding a bird") & defyes==.
replace  defyes=1 if index(note_text, "riding a "bird"") & defyes==.
replace  defyes=1 if index(note_text, "segway scooter") & defyes==.
replace  defyes=1 if index(note_text, "bird accident") & defyes==.


replace  defyes=0 if index(note_text, "lime away") & defyes==.
replace  defyes=0 if index(note_text, "cutting a lime") & defyes==.


replace  defyes=0 if index(note_text, "ladybird") & defyes==.

replace  defyes=0 if index(note_text, "lime disease") & defyes==.
replace  defyes=0 if index(note_text, "sublime") & defyes==.
replace  defyes=0 if index(note_text, "lime oil") & defyes==.
replace  defyes=0 if index(note_text, "lime green") & defyes==.

replace  defyes=0 if index(note_text, "power scooter for mobility") & defyes==.
```



Initial Search: 523 Visits

Automated and Manual Chart Review

Final Count: 249 injuries

Results

Characteristic	Number (%)
Total Patients	249
Riders	228 (92%)
Non-riders	21 (8%)

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Mechanism of Injury (riders)	
Fall	183 (80%)
Collision with object	25 (11%)
Hit by vehicle	20 (9%)

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Blood alcohol level > 0.05% or documented as intoxicated	12 (5%)

Results, cont.

Imaging Received	Number (%)
Any imaging test	200 (80%)

Results, cont.

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Any imaging test	200 (80%)
X-rays	
Forearm/Wrist/Hand	91 (37%)
Knee/Lower Leg/Ankle/Foot	50 (20%)
Chest	43 (17%)

Results, cont.

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Any imaging test	200 (80%)
X-rays	
Forearm/Wrist/Hand	91 (37%)
Knee/Lower Leg/Ankle/Foot	50 (20%)
Chest	43 (17%)
CT scan	
Head	74 (30%)
Head and cervical spine	45 (18%)
Head, cervical spine, chest, abdomen, pelvis (“Pan-Scan”)	21 (8%)

Results, cont.

Injury Characteristics	Number (%)
Any fracture	79 (32%)
Forearm/Wrist/Hand	48 (20%)
Upper Arm/Shoulder	17 (7%)
Face	14 (6%)
Knee/Lower Leg/Ankle/Foot	11 (4%)

Results, cont.

Injury Characteristics	Number (%)
Any fracture	79 (32%)
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Head injury	100 (40%)
Intracranial hemorrhage	5 (2%)

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Lacerations	71 (28%)
Contusions, sprains	69 (28%)

Results, cont.

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Head injury	100 (40%)
Intracranial hemorrhage	5 (2%)
Lacerations	71 (28%)
Contusions, sprains	69 (28%)
Major intra-abdominal or intrathoracic injuries	3 (1%)

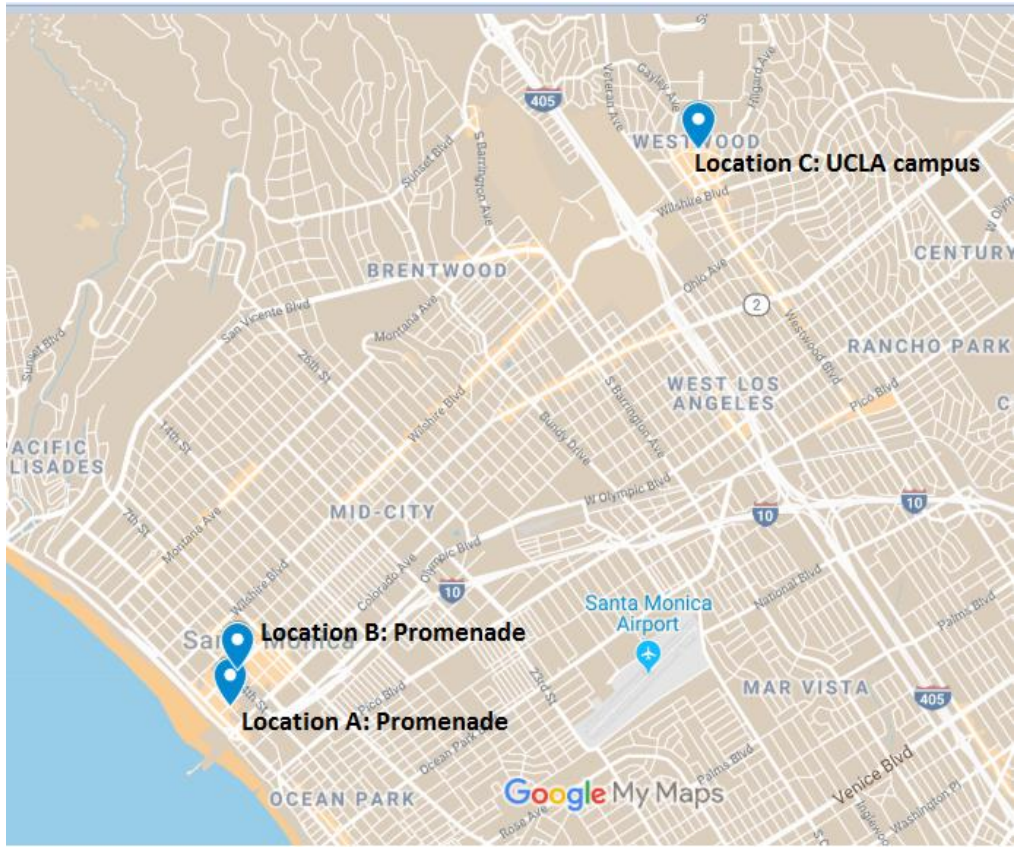
Results, cont.

Characteristic	Number (%)
ED disposition	
Home	234 (94%)
Admit to floor	13 (5%)
Intensive care unit	2 (1%)

Methods: Observational Component

- 3 Locations, 7 hours
- Weekdays and Weekend
- 5 Variables recorded

Observed Riders (N=193)
No Helmet
Riding on Sidewalk
Breaking a Traffic Law
Double-Riding
Pediatric Rider



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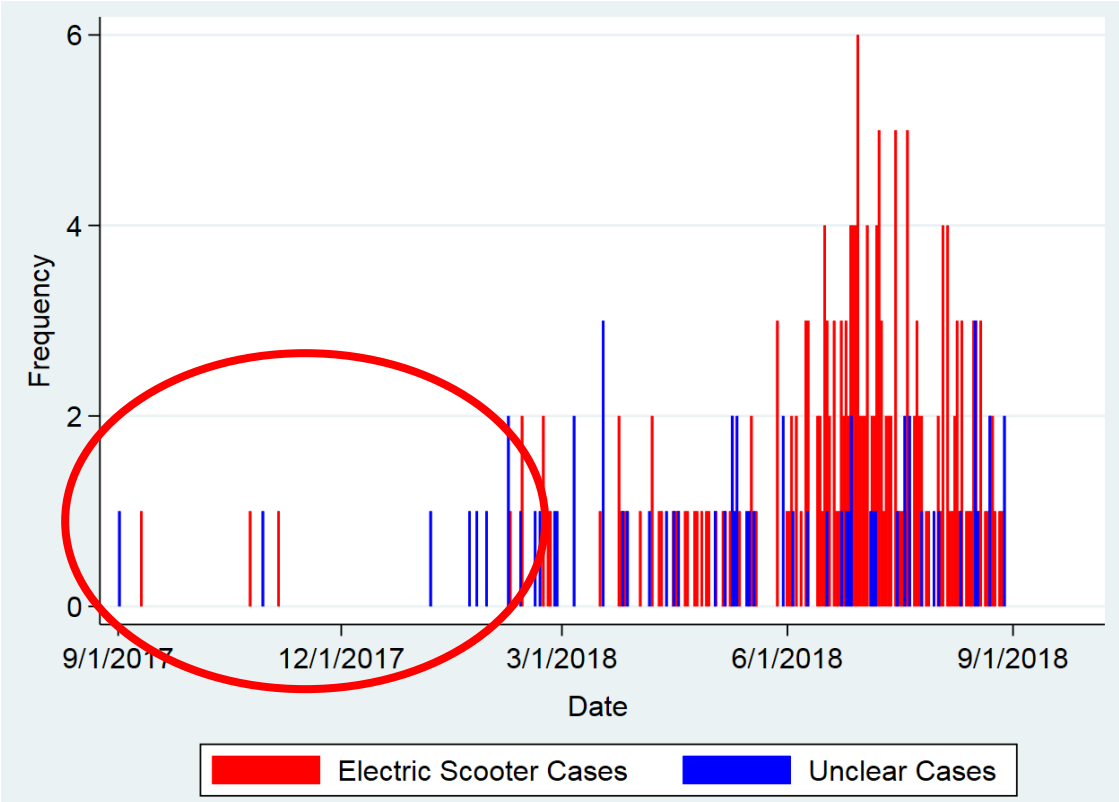
No Helmet	94%
Riding on Sidewalk	26%
Breaking a Traffic Law	9%
Double-Riding	8%
Pediatric Rider	5%

Limitations and Considerations

- Did not have the ability to calculate a "rate"
- No comparison to other modes of transportation (bicycles)
- Limited information on mechanism
- Scooter use low in the first 6 months during initial roll-out
- 74 unclear cases
  - "Patient was riding a scooter"

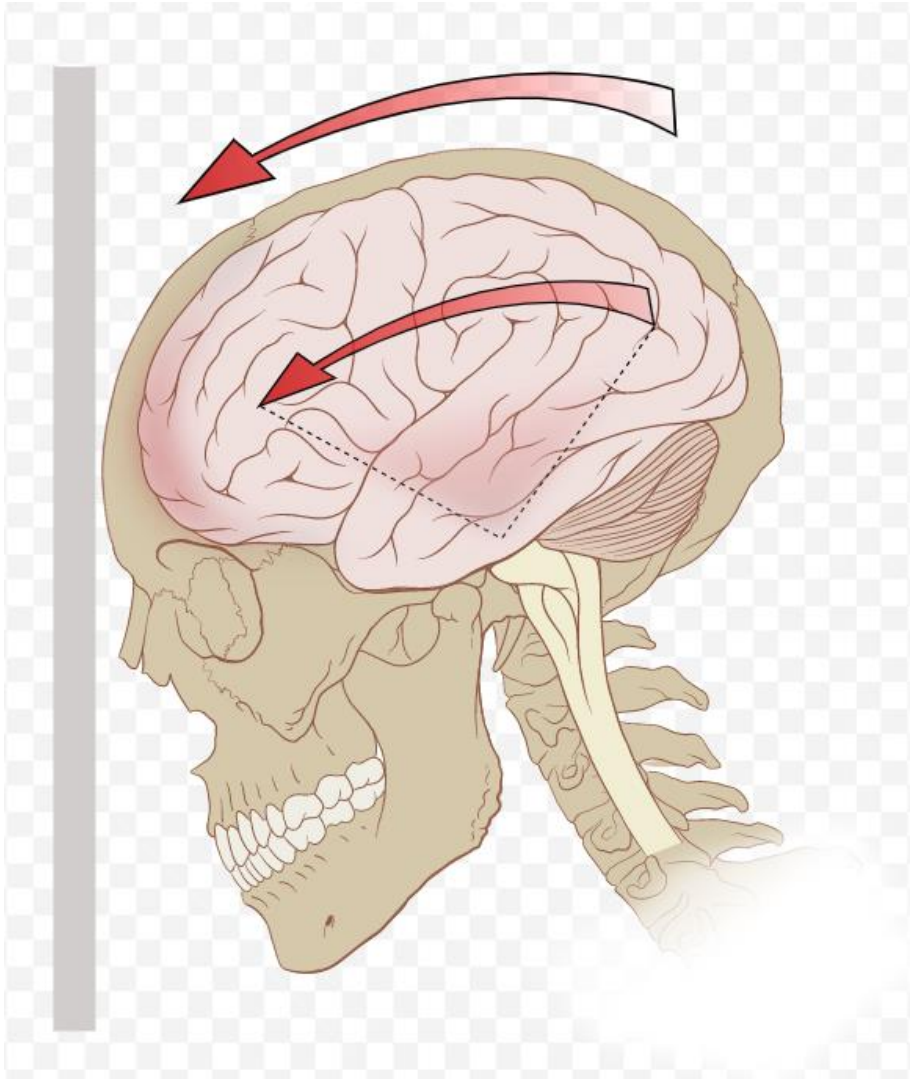


Discussion

- Electric scooters have the potential to lead to significant injuries
- Existing regulations are seldom followed
- Transportation is often governed at local levels, a variety of policy solutions are being implemented, and best-practices policies should be identified.

Future Directions

- Longer-term consequences of injuries, especially concussion syndromes



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- Building data collection into Emergency Department triage work-flow

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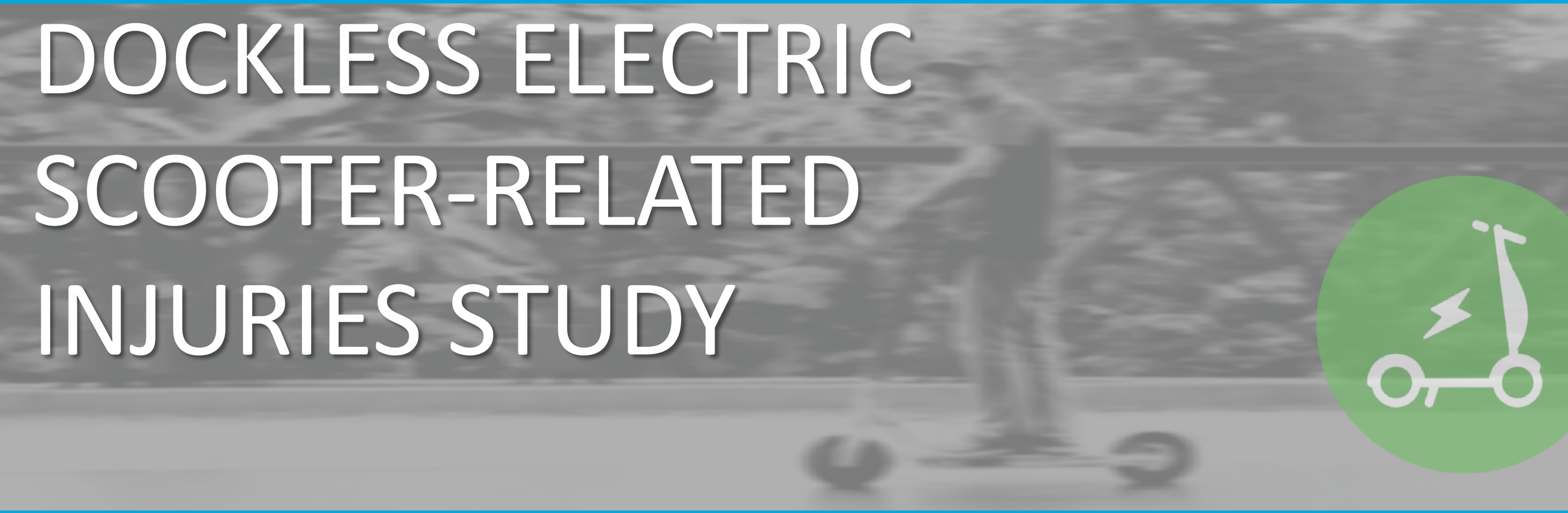
- Changing the culture around helmet use through incentives or design

DOCKLESS ELECTRIC SCOOTER-RELATED INJURIES STUDY



Austin, Texas

SEPTEMBER- NOVEMBER 2018

EPIDEMIOLOGY AND DISEASE SURVEILLANCE UNIT
EPIDEMIOLOGY AND PUBLIC HEALTH PREPAREDNESS DIVISION
AUSTIN PUBLIC HEALTH

E-Scooters

- Stand up
- Rented
- Speeds ~15 mph
- Electric power
- Dockless

Methods

Methodology

- Place: City of Austin, Texas
- Time: September 5 – November 30, 2018
- Persons: sustained injury related to e-scooter identified through keyword searches
    1. Austin-Travis County Emergency Medical Services
    2. Hospital Emergency Department chief complaint from syndromic surveillance

Data collection

- Patient interviews through telephone questionnaire
  - Demographic
  - Clinical
  - User-specific
  - Environmental
- Supplemented with
  - EMS call reports
  - Medical charts, when available
- Publicly available Fleet Data (Austin Transportation Department)

Case Definition

	Confirmed
Interview	D/R Electric Scooter

Medical Report	D/R Electric Scooter

D/R = Dockless/Rented

Case Definition

	Confirmed	Probable
Interview	D/R Electric Scooter	

Medical Report	D/R Electric Scooter	Electric Scooter

D/R = Dockless/Rented

Case Definition

	Confirmed	Probable	Suspect
Interview	D/R Electric Scooter		

Medical Report	D/R Electric Scooter	Electric Scooter	Scooter

D/R = Dockless/Rented

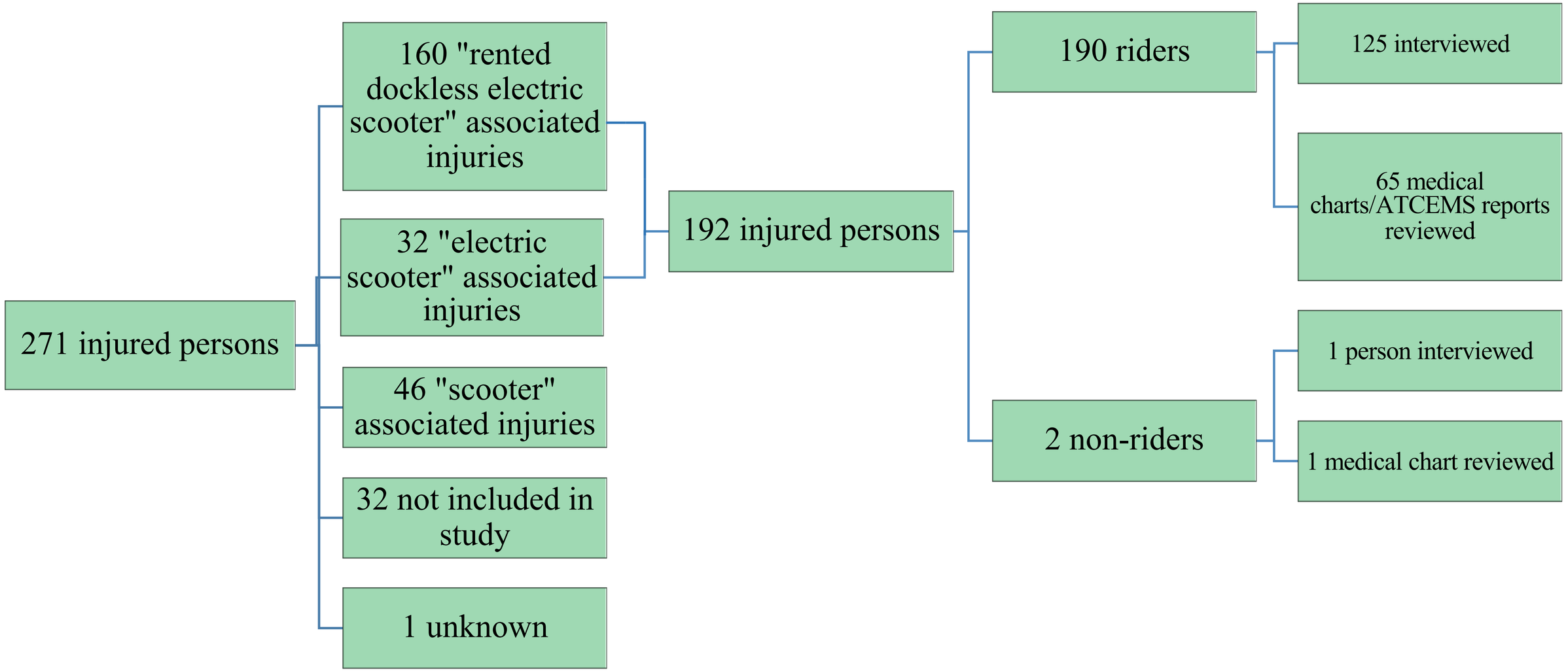
Case Definition

	Confirmed	Probable	Suspect	Not a Case
Interview	D/R Electric Scooter			Denied

Medical Report	D/R Electric Scooter	Electric Scooter	Scooter	

D/R = Dockless/Rented

Outcomes of classifying persons



Injury rate

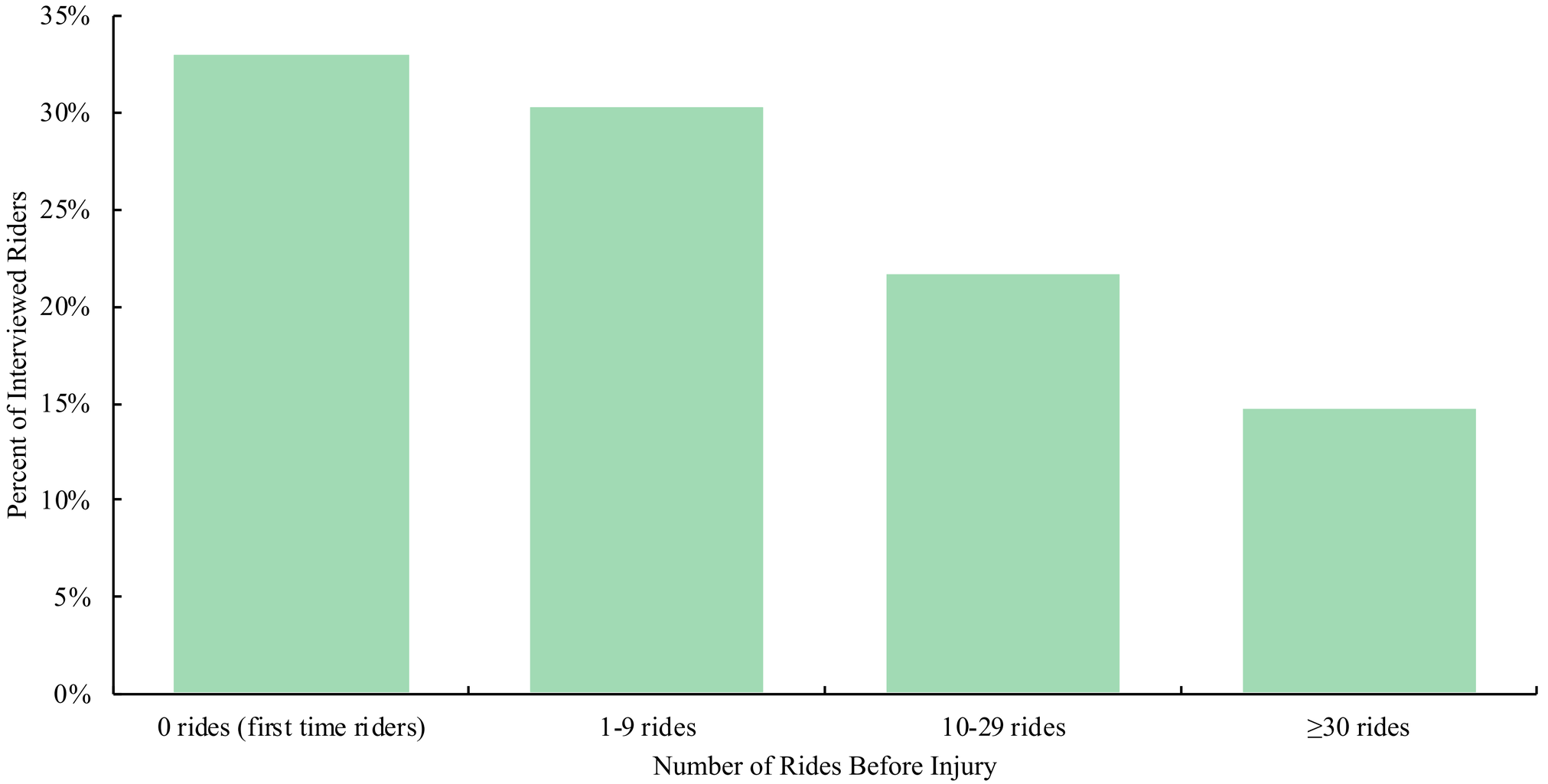
- During the study period:
  - 190 injured riders
  - 936,110 e-scooter trips
- About 20 persons injured per 100,000 e-scooter trips

Who were the riders?

- Over half (55%) were males
- Ranged in age from 9 to 79 years
  - Nearly half (48%) were 18 to 29 years of age
- Most (60%) resided in Austin

Scooter Rides Before Injury

First time electric scooter rider – 33%



How serious were the injuries?

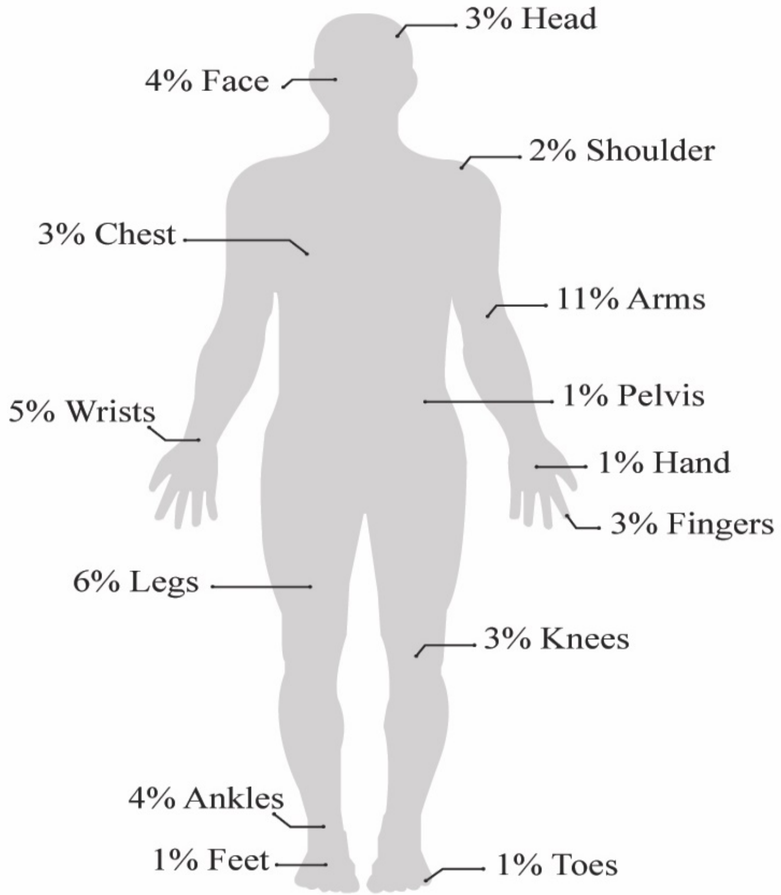
- 42% of the 190 riders had a serious injury*
- 7% sustained a traumatic brain injury

**National Transportation Safety Board's definition: fracture (excluding nasal, finger, toe); nerve, tendon or ligament injuries; 48+ hours in hospital; severe bleeding; and/or organ damage*

Where were riders injured?

- Head – 48%
  - Face – 40%
- Upper limbs – 70%
- Chest/abdomen – 18%
- Lower limbs – 55%

Bone fracture locations



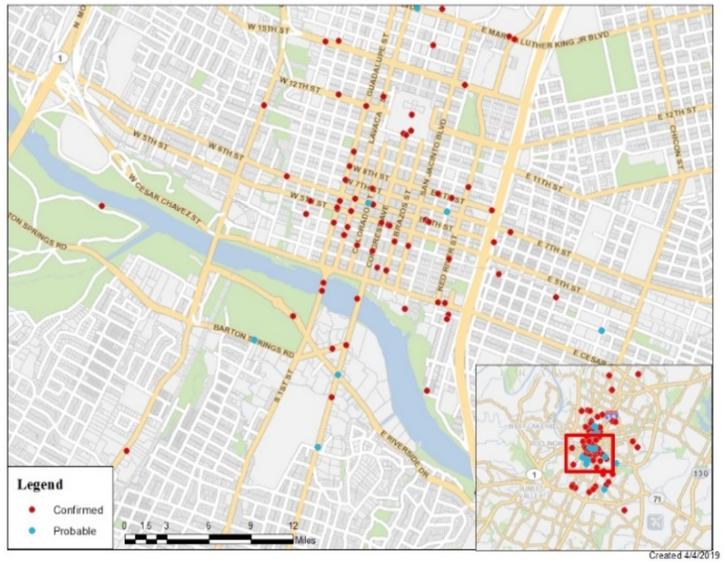
78 persons sustained at least one fracture

Injured riders

- 14% were hospitalized
- No deaths
- Only one rider (<1%) was wearing a helmet

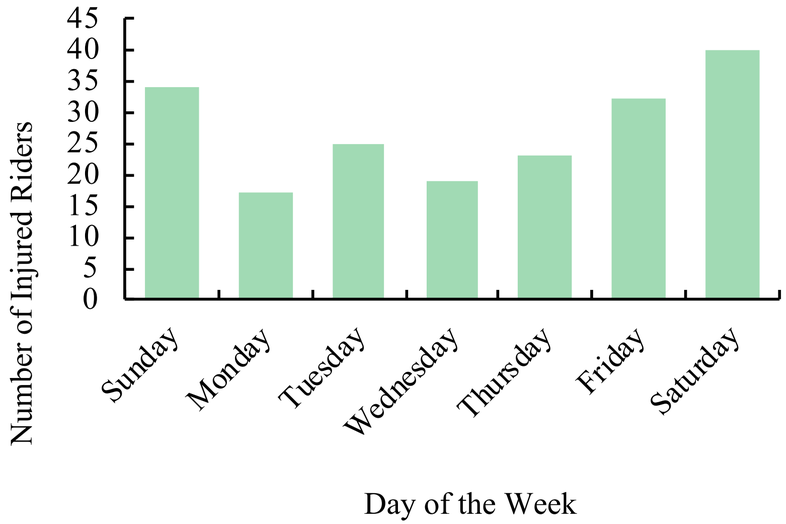
Geographic Characteristics

- Downtown Austin – 31%
- University of Texas at Austin campus – 16%
- Injured while riding scooter on street – 55%
- Injured while riding scooter on sidewalk – 33%



When were riders injured?

- About two injuries per day
- Saturday or Sunday – 39%
- Between 6:00pm and 6:00am – 39%



Circumstances of incidents

- Involved a motor vehicle – 16%
- Involved colliding with a motor vehicle – 10%
- Others involved curb (10%), and inanimate object (7%)

Additional Information

- Drinking alcohol beverages within 12 hours preceding injury – 29%
- Excessive speed – 37%
- Possible scooter malfunction – 19%
- Believed surface conditions contributed to incident – 50%
- Received training via scooter companies' phone application – 60%

Key findings

- First time using an electric scooter – 33%
- Limited helmet use – <1%
- Traumatic brain injury – 7%
- Few collisions with motor vehicles – 10%

Acknowledgements

Austin Public Health	Centers for Disease Control and Prevention
Jeff Taylor	Laurel Harduar Morano
David Zane	Talia Pindyck
Alice Tisdale	Sara Blythe Ballard
Jessica Stradford	Anjoli Anand
Ashley Hawes	Alexis Peterson
Flor Hernandez-Ayala	Erin Sauber-Schatz

Acknowledgements

- Austin-Travis County EMS
- 9 area hospitals
- Austin Transportation Department
- Injured individuals that we interviewed

Questions?

Austin Public Health Contact Information:

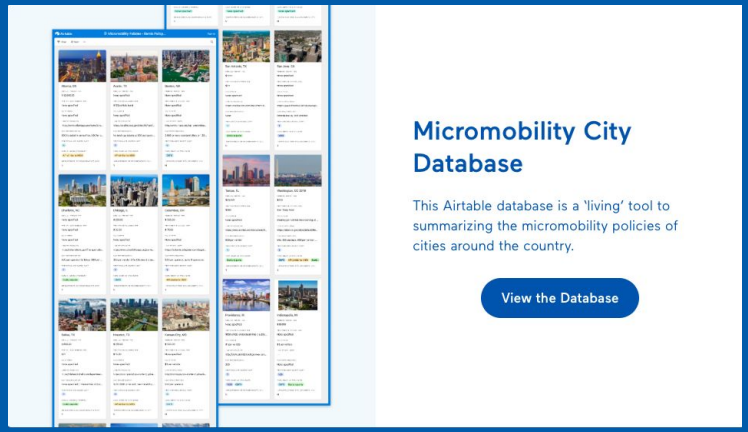
- David Zane (david.zane@austintexas.gov)
- Jeff Taylor (Jeff.taylor@austintexas.gov)

Cities + Scooter Safety

Prepared for NABSA
6/25/2019

remix

Our vision is to empower cities to manage all aspects of transportation and create equitable, safe, and accessible outcomes.



Micromobility City Database

This Airtable database is a 'living' tool to summarizing the micromobility policies of cities around the country.

View the Database

Micromobility Policy Survey

We conducted a survey of cities' approaches to managing and regulating shared electric scooters and bikes through local policies and permits. Read our blogpost for mobility brief highlights and recommendations.

Download the full Mobility Brief

How are cities encouraging safe scooter programs?

Themes we will review

- → Infrastructure
- → Speed
- → Vehicle technology
- → Education
- → Enforcement

Courtesy of SFMTA

Infrastructure + Speed

Stats from Austin:

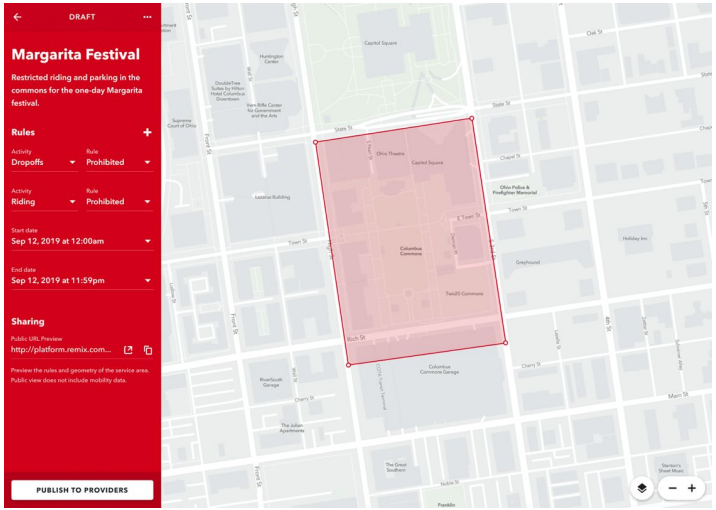
→ 55% injured in the street
→ 50% believed a pothole or crack contributed to their crash
→ 37% reported that excessive scooter speed contributed to their injury

Stats from SF:

→ 58% of SFPD collisions occurred on the high injury network
→ 83% of crashes occurred in the roadway

remix

Courtesy of NY DOT



Vehicle Technology

Stats from Austin:

→ About ⅓ were injured on the sidewalk

Stats from Santa Monica:

→ 8% of crashes were pedestrians (half hit by scooter, half tripped over scooter)

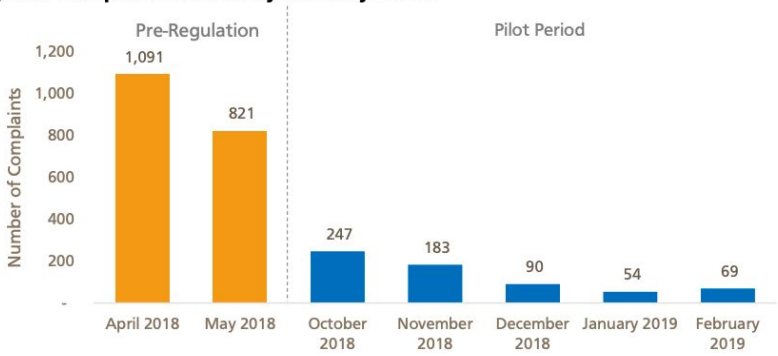
Courtesy of SFMTA

Education & Enforcement

Austin Study

→ 33% were taking their first ride
→ 30% were taking their 1-9 ride

Figure 6 –Complaints Received by SFMTA by Month[14]



Thank you

remix

NABSA SHARED E-SCOOTER SAFETY PRINCIPLES AND RESOURCES

Shared e-scooters have quickly become a popular way for people to get to where they need to go. However, injury rates of riders in cities where they are deployed have raised flags for regulators, media, healthcare professionals, researchers, and operators alike.

The popularity and rapid adoption of shared e-scooters in communities across North America speaks to the positive impacts that they can offer as a mobility option– low cost, low carbon, first/last mile connection, and more. And, this mode is still new for riders, operators, and regulators. Because so many people and communities are affected by this innovation in the way we move through cities, the safety of the vehicles and the places where they are ridden is paramount.

As detailed in the NABSA Code of Conduct, the association is dedicated to Safety, Cooperation, and Transparency in the bikeshare and shared micromobility industry. With this in mind, NABSA offers the following information to encourage safety as shared e-scooters are piloted and adopted in communities across North America.

- **Shared e-scooters as a mobility mode are new, and only just beginning to produce the data we need to draw concrete conclusions.** Preliminary research has been conducted by the Austin Public Health with support from the CDC, UCLA, and the City of Baltimore that

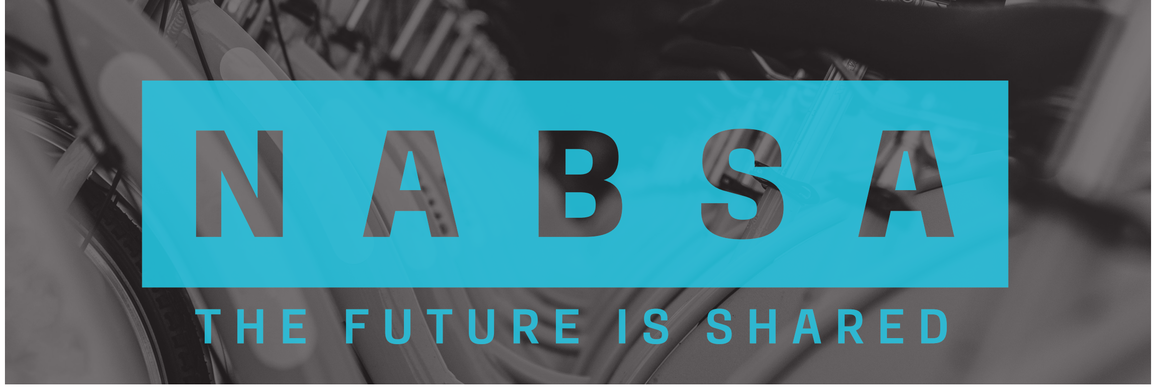
HOW WE MOVE

MICROMOBILITY » MACRO IMPACT

2019 NABSA CONFERENCE

2019 Conference
September 30 – October 2
Indianapolis, Indiana

Thanks to Our Presenting Sponsor!



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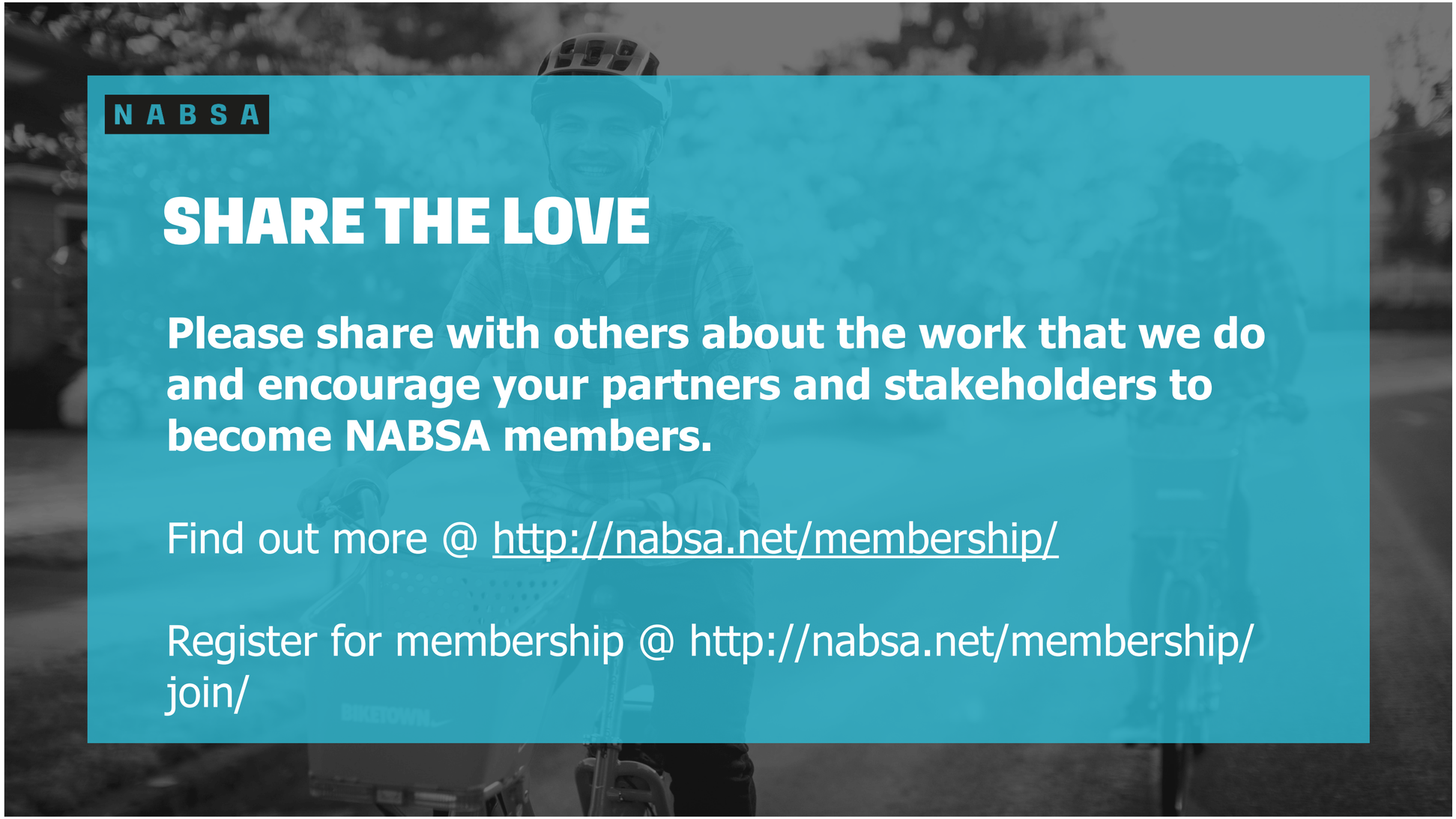
As an employee of a NABSA member organization, you receive benefits and resources!

Get access by doing the following:

1) **Sign up for a Knowledge Share database account** at https://nabsa.net/sign-in-sign-up/ for unlimited access to hundreds of resources and members-only webinars.
2) **Sign up for the NABSA newsletter** and important announcements by subscribing on the homepage at nabsa.net.
3) **Participate in the NABSA members-only email listserv**. If you are not yet on the list, email executivedirector@nabsa.net to be added.

Interested in getting more involved in NABSA?

1) **Submit resources to be added to the Knowledge Share database**.
2) **Consider running for a seat on the NABSA board in an upcoming election.** More information about the NABSA board positions and elections is disseminated through the members-only listserv.



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SHARE THE LOVE

Please share with others about the work that we do and encourage your partners and stakeholders to become NABSA members.

Find out more @ http://nabsa.net/membership/

Register for membership @ http://nabsa.net/membership/join/


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