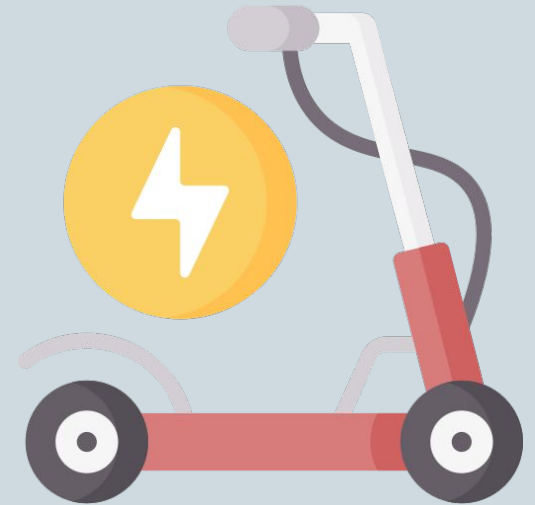




# E-Scooter Infrastructure At Rice University

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Sabrina Sun, Genesis Hahn, and Kimberly Sanchez



# Agenda

**01**

**Overview of the  
Problem**

**02**

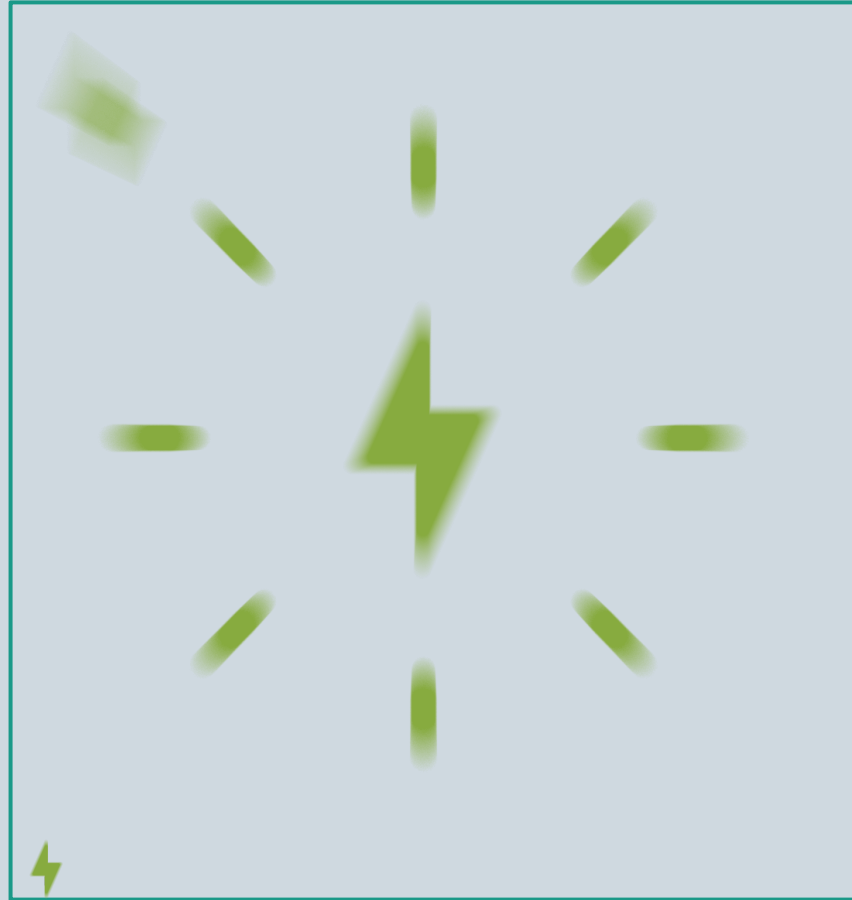
**Case Study**

**03**

**Step-by-Step  
Solution**

**04**

**Q&A**

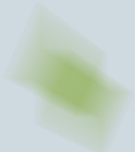


# Overview of the Problem


# Boom in E-Scooter Usage

- E-Scooter manufacturers are seeing a rapid increase in sales
- Since March 2021—
  - 70% increase in sales for Fluidfreeride
  - 60% increase in sales for Bird

- Reasons for Increased popularity of E-Scooter—
  - Surging gasoline prices
  - Micromobility
  - Low maintenance
  - Similar price to bike



## Richard Johnson's Comments on Rice's Electric Scooter infrastructure



“Virtually **non-existent with respect to anything intentional**, so what you’re seeing is the chaos of scooter users taking the devices wherever they want and dealing with the fact that there are **no rules, policies, or infrastructure to support or guide their use.**”

# Lack of Infrastructure and Regulation for E-Scooters at Rice

- No Parking Spots
- Unclear Traffic Rules
- Safety Concerns
  - Scooter Thefts
  - Fire Hazards
  - Accidents



# Unclear Traffic Instructions from RUPD

We've heard from many people across campus about these concerns. I'm writing to you today to share how this concern is being actively addressed. A working group is looking closely at bicycle and scooter safety specifically. We anticipate updating the bicycle policy to include scooters as well. Before this updated version is shared with the community, we're asking our community to remember the "road rules" related to our campus – whether you're walking, scootering, biking, driving, or skating. Keep these items in mind:

**Do:**

- Park your scooter, bicycle, or skateboard in an appropriate area
- Follow the traffic rules
- Dismount in areas where dismount is indicated
- Alert pedestrians when near – ring a bell or yell



**Don't:**

- Block parking spaces, egress doors, and hallways when parking your scooter, bicycle, or skateboard
- Ignore traffic signs or ride against traffic
- Ride on sidewalks, in arcades, or other covered walkways

As a reminder, please use your best judgment as a pedestrian or operator of a wheeled device. Thank you for being so committed to campus safety.

Chief Clemente Rodriguez

Email From RUPD to Students



## **Proposed Solution: Case Studies**

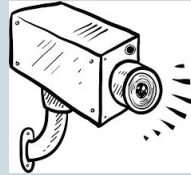


# Case study - scooter share, safety and campus design



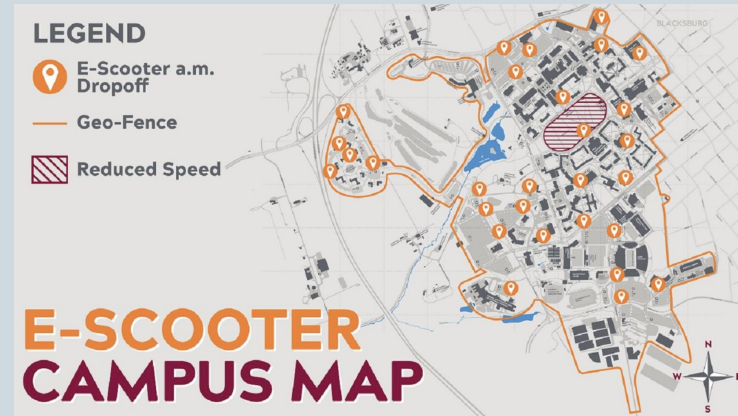
50 scooters

Analyze riding behaviors & safety data



20 public cameras

Security & analyze scooter interactions



## Result:

- 1- Enhanced risks associated with riding on varying topographies.
- 2- Wearing helmets should be encouraged
- 3- Safety rules: reinforced by quizzes and signs
- 4- Effective speed reduction sign + speed bumps
- 5- Intoxication test



**Proposed Solution:  
Redesigning  
policies & facilities**

# “E-Scooter Map”



Stop Zones



Charging Zones



Parking Zones



# Survey of Rice Campus



## Kraft Hall & Jones Business School

- No covered parking areas
- Indoor parking: fire hazards



## Fondren Area & Central Quad

- Scooters not currently included in campus safety discourse



## Between Rec & Wellness Center

- Intersection safety: bikes, skateboards, vehicles, scooters, and pedestrians

# Rice needs a multi-dimensional plan to accommodate scooters

## Key Insights

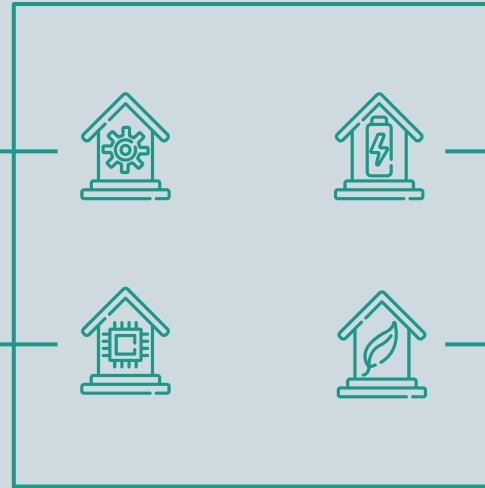
### Infrastructure

Indoor vs. Outdoor

Facilities Designed for Bikes vs. for Scooter

### Parking

Parking racks specifically for Scooters



### Charging

Covered Walkways

Charging Shed Proposal

### Energy Efficiency

An Alternative Last Mile Transportation Solution



Rice needs  
**explicit** rules to  
safely  
**accommodate**  
scooters on  
campus.



“I prefer a light touch when it comes to regulation, so really I think the approach is about how do we **safely accommodate scooters on campus** while adjusting our built environment to encourage “good” behavior while making “bad” behavior more difficult. **We do need some explicit rules**, like do not ride your scooters inside buildings, because we get a lot of complaints about that and that’s dangerous.”

# Registration Policies

## Registration as a requirement for scooter ownership

- Simple safety quiz
- Contract to adhere to rules
- Accountability

## Registration Stickers

- Personal and Property Safety
- Data on campuswide scooters

## Case Study: Current Bike Registration Policy

### Take this quick test to continue with your registration:

Unregistered bikes are subject to citation and removal? \*

- True
- False

Bicycles are not required to stop for stop signs? \*

- True
- False

Riding bikes in covered walkways is permitted?\*

- True
- False

Pedestrians always have the right of way? \*

- True
- False

Bicycles are not required to comply with Motor Vehicle Traffic Regulations? \*

- True
- False



The safety issue of electric scooters also impacts **riders, vehicles, and pedestrians**



“I [...] regularly see people riding scooters in really unsafe ways – like going the **wrong way at night** down Rice Blvd into oncoming vehicular traffic, while apparently looking at an iPhone. I will also add that I **rarely see someone use a helmet on a scooter**, whereas it’s pretty common to see someone wear a helmet when they are riding a bicycle.”



# Training Policies

@riceuniversity



- RUPD training sessions and safety quizzes on scooter safety concerns and road rules
- Complete the training to connect your scooter with your ID
- Future convenience: Swipe to charge and park at power stations

# Proposed E-Scooter Traffic Regulation

Scooter Version Needed

Standardized Registration Procedure

## REGISTER YOUR BIKE

All bicycles on campus must be registered. Registration helps RUPD to identify owners of lost, stolen or impounded bicycles and to disseminate safety information. Bicycle registration is free. Unregistered bicycles risk receiving a citation and removal by RUPD. For information on how to register your bicycle, please go to the Bikes at Rice Website <http://www.rice.edu/bikesatrice/>, stop by the RUPD, or call 713 348-6000.

Detailed Rules and Guidance

## THE RULES OF THE ROAD

Cyclists riding in the street are required to comply with motor vehicle traffic regulations. Cyclists should obey traffic signs and always ride with the traffic. At all stop signs, cyclists must stop and yield the right-of-way to other vehicles and pedestrians already at the intersection. RUPD will ticket cyclists for right-of-way violations at intersections. Links to traffic laws relevant to cyclists are available on the [Bikes at Rice Website](#).

## YIELD TO PEDESTRIANS

Pedestrians have the right of way on sidewalks, in crosswalks, and around any stopped bus. Pedestrians are encouraged to be aware of their surroundings, but it is the cyclist's responsibility to yield to a pedestrian. Cyclists may not pass any bus that has stopped to pick up or discharge passengers. Rice has adopted a "Bell or Yell" program for cyclists to announce their approach when encountering pedestrians.

Parking & Power Stations for Scooters

## RIDING PROHIBITED IN COVERED WALKWAYS

Covered walkways are off limits to bicycle riding. Because covered walkways have blind corners and are located in front of building entrances, cyclists must walk their bicycles in these areas of campus. RUPD will issue citations for riding a bicycle in these prohibited areas.

## RIDING BICYCLES ON SIDEWALKS


Cyclists are encouraged to use the streets rather than the sidewalks whenever possible and to walk their bicycles on congested sidewalks. Except for covered walkways and where otherwise posted, such as around the Brochstein Pavilion, bicycle riding is permitted on sidewalks. Every person riding a bicycle on a sidewalk must (i) ride in a careful and prudent manner, (ii) slow to a near walking pace within 10 feet of any pedestrian or building entrance, (iii) yield the right of way to pedestrians, and (iv) give an audible signal before overtaking and passing any pedestrian. Cyclists should keep in mind that a pedestrian may be visually impaired, hearing impaired, infirm, or a campus visitor and that pedestrians may make sudden, unpredictable movements. Accidental collisions may seriously injure pedestrians or other cyclists. A cyclist who strikes someone may be liable for personal injuries and property damage.

## LOCK YOUR BICYCLES IN RACKS



Cyclists are expected to secure their bicycles in the bicycle racks. Rice has bicycle racks that are conveniently located throughout the campus. Bicycles secured to fences, sign posts, stair railings or other locations other than bicycle racks may be ticketed or impounded. Locks damaged in the removal will be the responsibility of the owner. Unsecured bicycles may be impounded for safekeeping.

## ABANDONED BICYCLES WILL BE REMOVED

Bicycles left unattended for an extended period of time are presumed to be abandoned and as such will be removed by the RUPD. Suspected bicycles will be tagged with a removal end date. Abandoned bicycles will be held at the RUPD for 60 days before they may be disposed unless prior notification has been made to RUPD. To retrieve an impounded bicycle, the owner must provide proof of ownership.



**Proposed Solution:  
Reimagining  
Infrastructure  
implementation**

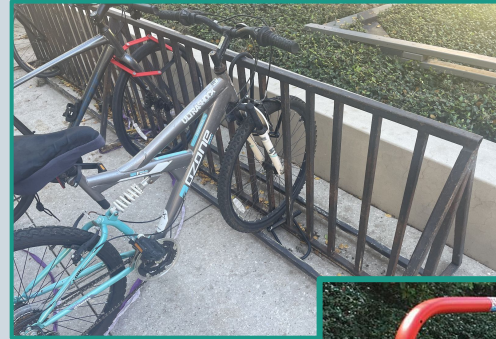


# Parking Solutions

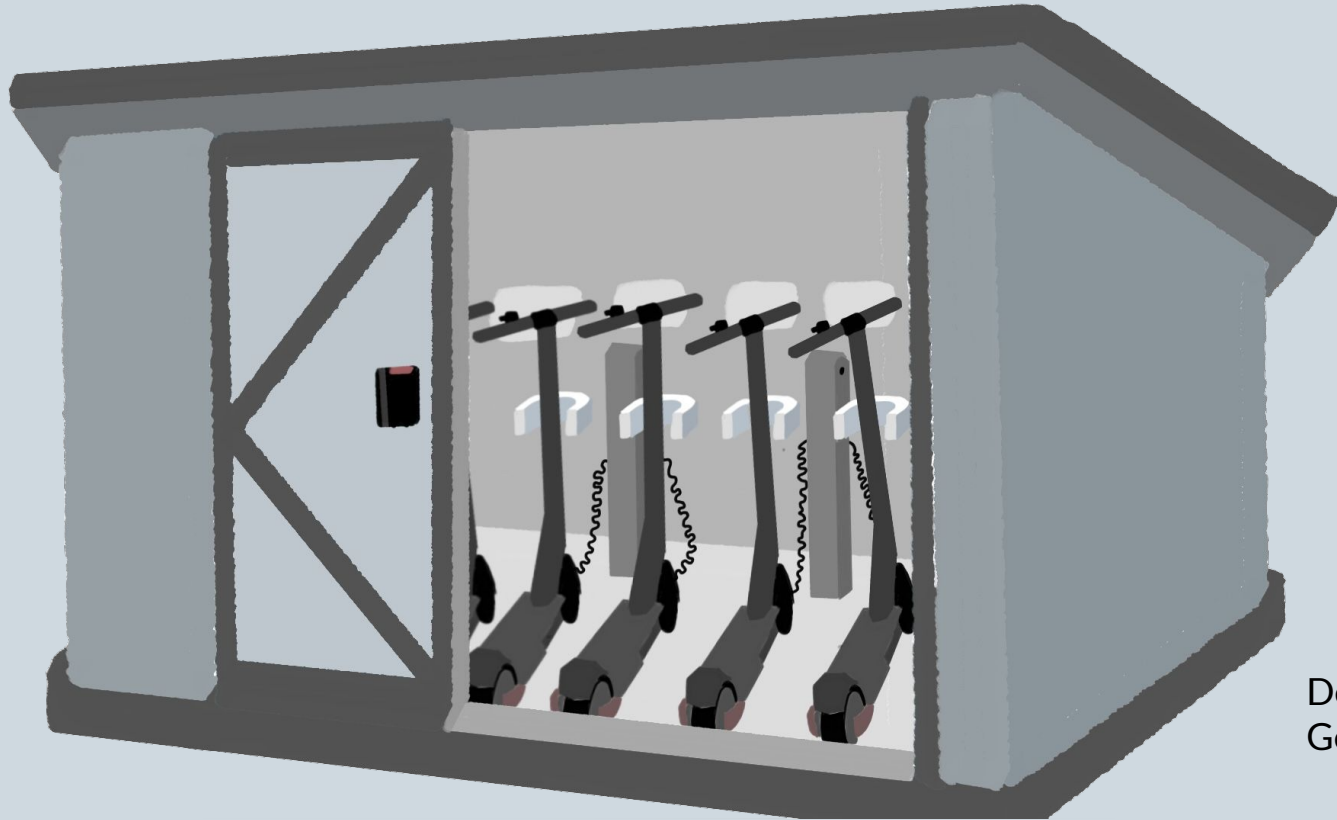
Dismount Commercial Scooter Rack:



Velopa Scooter Rack:



# Sample Covered Parking Solution



Designed by  
Genesis Hahn

# Charging: Power Stations

- ❑ Establish parking areas around covered walkways
- ❑ Design “Parking Sheds”
- ❑ Optimize campus space planning



## Charging: Price Estimation

For mid-capacity scooters, it costs US owners an average of 33 cents per month in electricity.

If 55% of Rice's total study body were to own a scooter:

**~\$11,000**  
**per academic year**

If every student paid a registration fee of \$5, this would offset the charging costs for Rice.



“So cool to hear about your scooter project! You should get them to install **solar-powered charging stations for scooters!**”



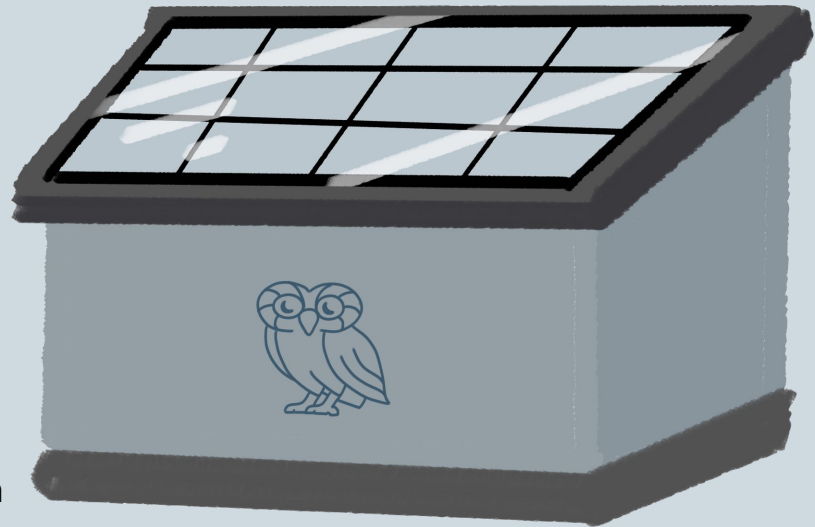
**Lisa Lin, Harris County Director of Sustainability**



# Charging: Sustainable Design

→ Offsetting scooter charging load with **sustainable design implementation:**


+ \$1,400.00  
per station

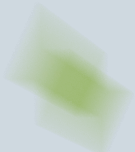


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Genesis Hahn




**Why should  
Rice care?**





**Richard  
Johnson's  
Final Thoughts on  
Electric Scooters  
at  
Rice University**



“Well, we can either actively promote their use, actively make it more difficult for them to be used, or be somewhat neutral about it.”

**Thanks!**

