Texas A&M Transportation Institute

Transforming Roads, Unleashing Smart Technologies
Texas TRUST Project

SAVING LIVES WITH CONNECTIVITY:
ACCELERATING VEHICLE TO EVERYTHING (V2X) DEPLOYMENT

Texas Motorcycle Safety Forum

May 3, 2025

What is Vehicle-to-Everything (V2X)?

V2X is communications technology that allows vehicles to communicate with each other, infrastructure, and other road users.

It enhances safety, mobility, and efficiency by enabling real-time alerts and coordination.

Helps prevent crashes, reduce congestion, and improve traffic flow through smarter transportation systems.

HOW IS V2X DIFFERENT THAN AUTONOMOUS VEHICLES?

CONNECTED ≠ SELF DRIVING

V2X enables communication between vehicles and the environment, while AVs rely primarily on vehicle sensors and cameras.

V2X supports cooperative driving, while AVs focus on making decisions independently.

V2X can enhance safety and awareness for human-driven vehicles, while AVs focus on self-driving capabilities.

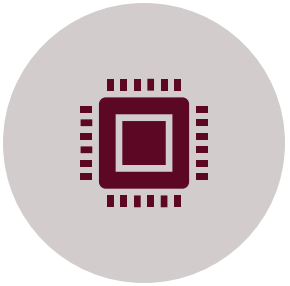
IS V2X NEW?

V2X is not a new concept, but its deployment is just beginning.

Research and testing have been ongoing for 20+ years, with pilots and early deployments across the U.S. and globally.

Advancements in wireless technologies, AI, and automation are now making large-scale deployment more feasible and impactful.

What's The Current Status of V2X?



Equipment – Sending information into the "air" is available.

Standards – Messaging standards exist and continue to evolve.

Vehicles – Few can receive (only a few very high-end models).

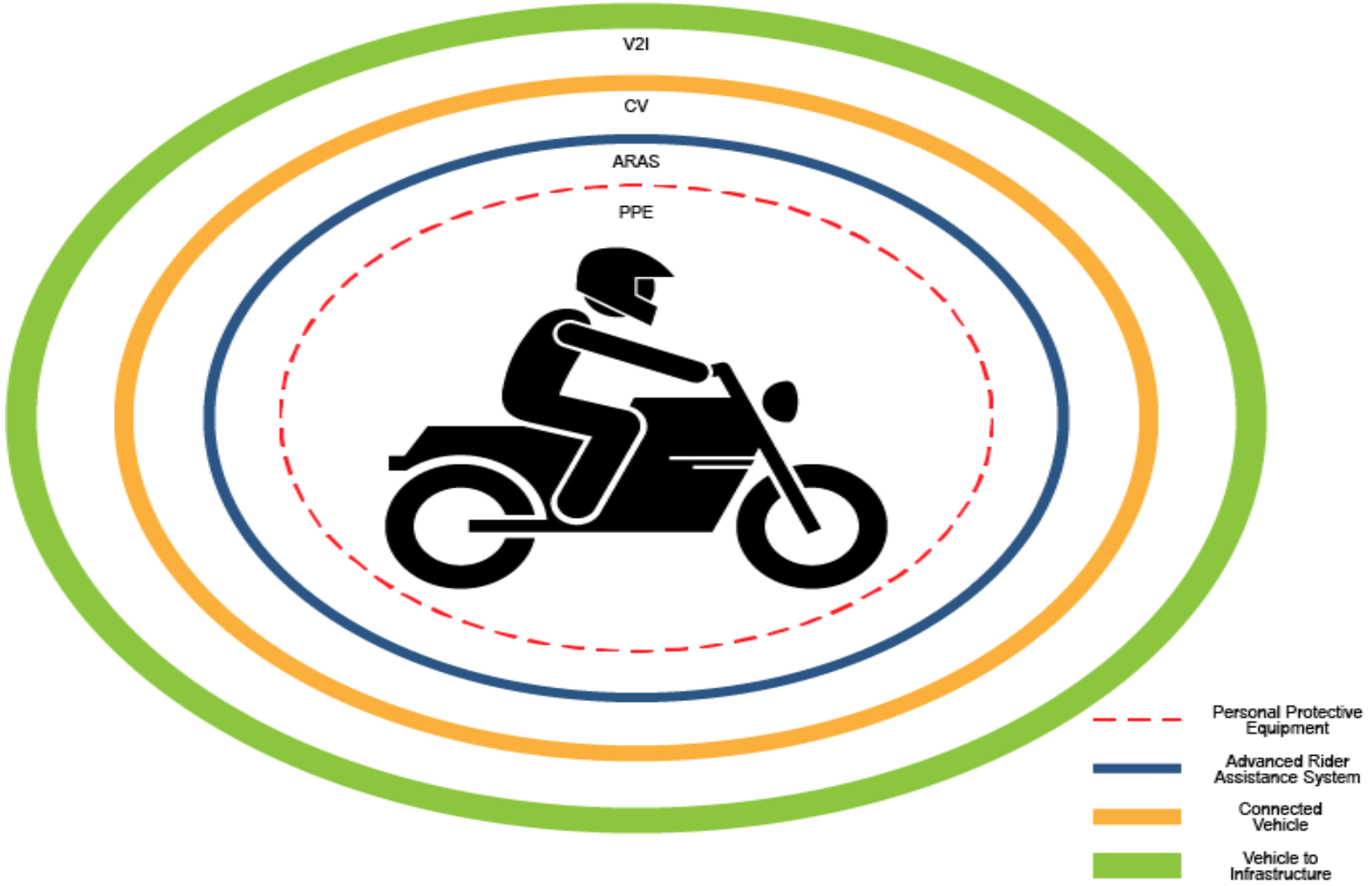
Prospective Users – No direct reception. A few cellphone apps.

Why would *Riders* Want To Implement V2X?

- **Improves Safety** – Helps prevents crashes with earlier alerts.
- **Increases Visibility** – Makes riders more noticeable to drivers.
- **Improves Knowledge** – Alerts about hazards, intersections, pavement conditions, and other drivers.
- **Emergency Response** – Speeds up emergency vehicle travel.
- **Enhances Traffic Flow** – Helps optimize signals and reduce congestion.
- **Cost-Effective Infrastructure Upgrade** – Improves existing roads without needing major construction.

Many of these benefits are enabled through infrastructure and will come at little to no cost to riders.

Why would riders want to implement V2X?



WHAT IS *TRUST* ALL ABOUT?

- Accelerate the adoption and deployment of ***interoperable connectivity***.
- Deploy, operate, document, and showcase.
- Integrated, advanced roadway deployments.
- Substantially and quantitatively improve system safety.

Project Goals

Safety, Mobility, Connectivity

Deploy integrated applications to substantially improve safety, mobility, efficiency, environmental impacts, equity, and ROI

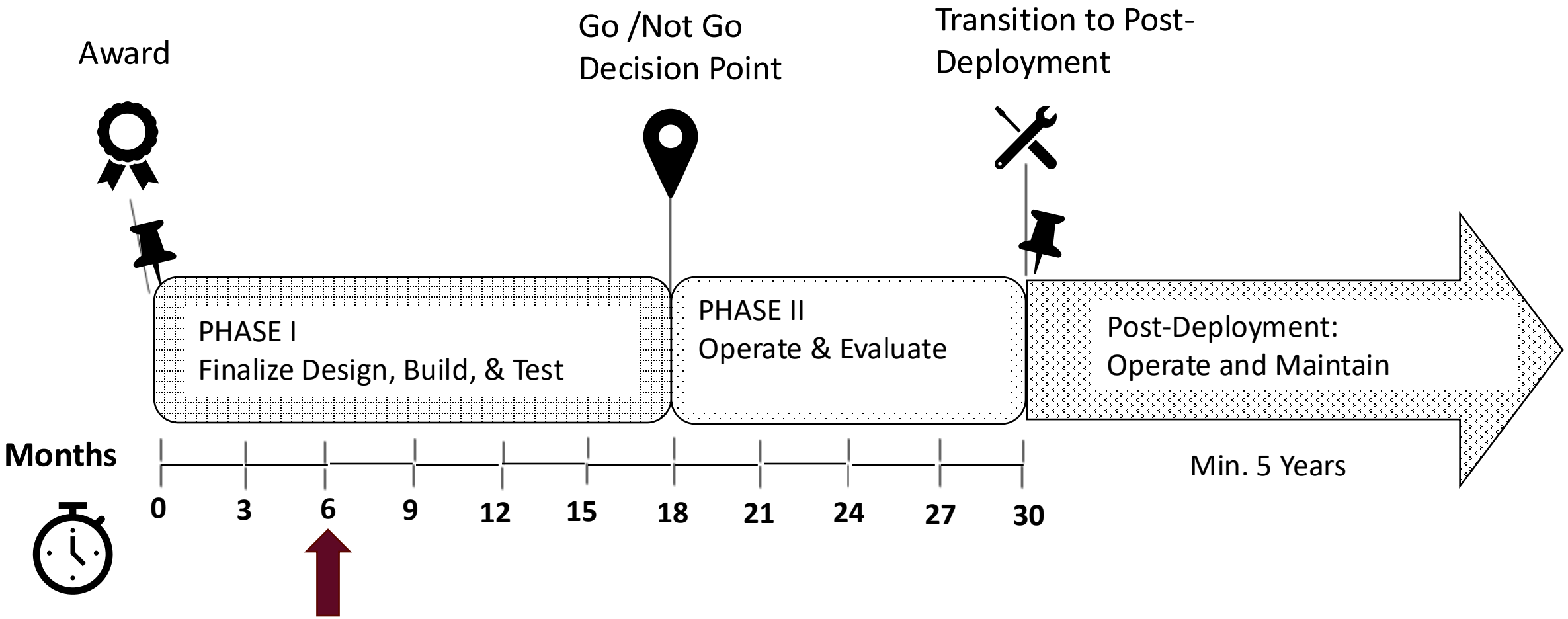
Outreach & Education

Inform and educate ITS community and general public regarding these impacts

National Blueprint

Support development and documentation of at-scale national deployment of interoperable connectivity

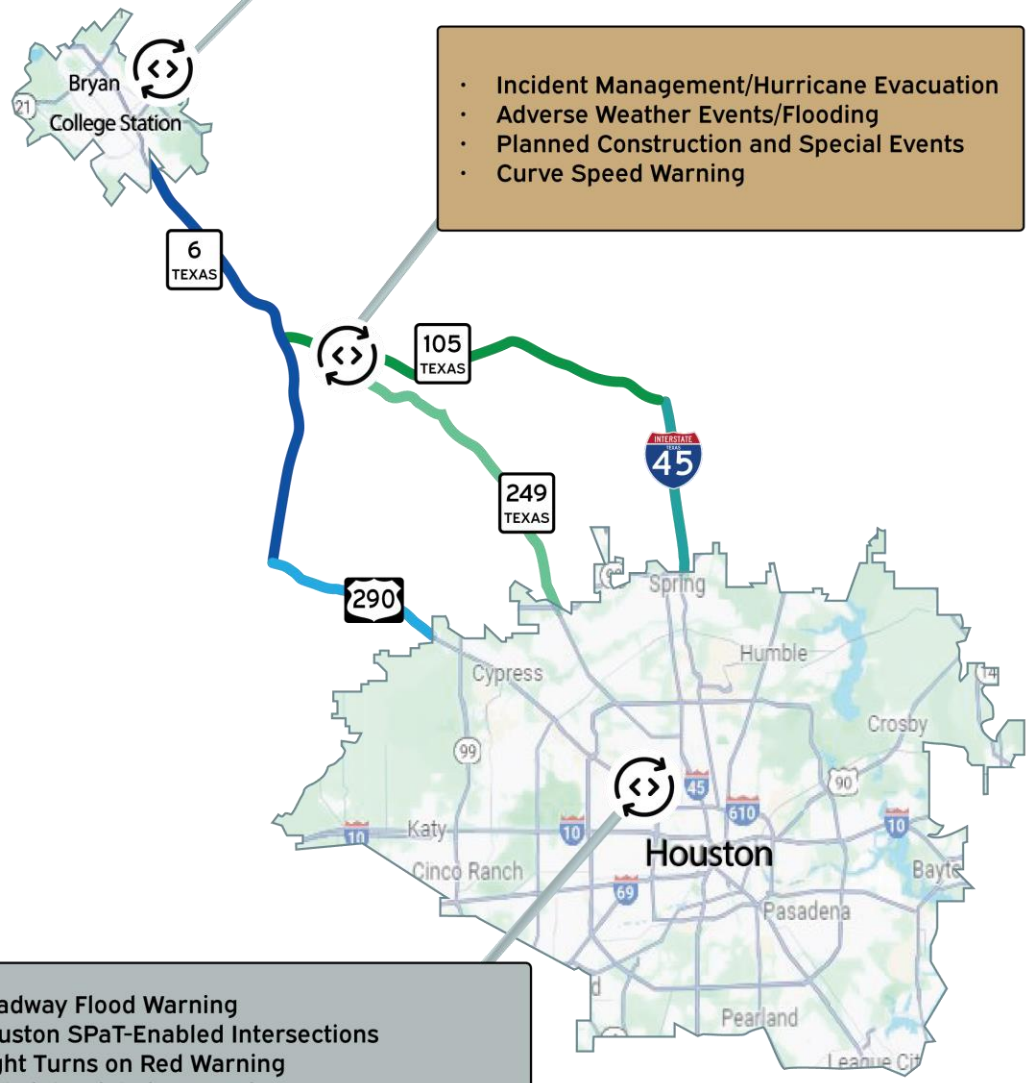
Project Schedule



Deployment Region

- SPaT-Enabled Intersections for VRU Identification and Protection
- Traffic Signal Preemption and Priority
- Transit Fleet Integration
- Every Day a Gameday
- Enhanced Highway Construction Worker Safety

- Incident Management/Hurricane Evacuation
- Adverse Weather Events/Flooding
- Planned Construction and Special Events
- Curve Speed Warning



- Roadway Flood Warning
- Houston SPaT-Enabled Intersections
- Right Turns on Red Warning
- Red Light Violation Warning
- Wrong Way Driving
- Emergency Vehicle Response Time and Safety

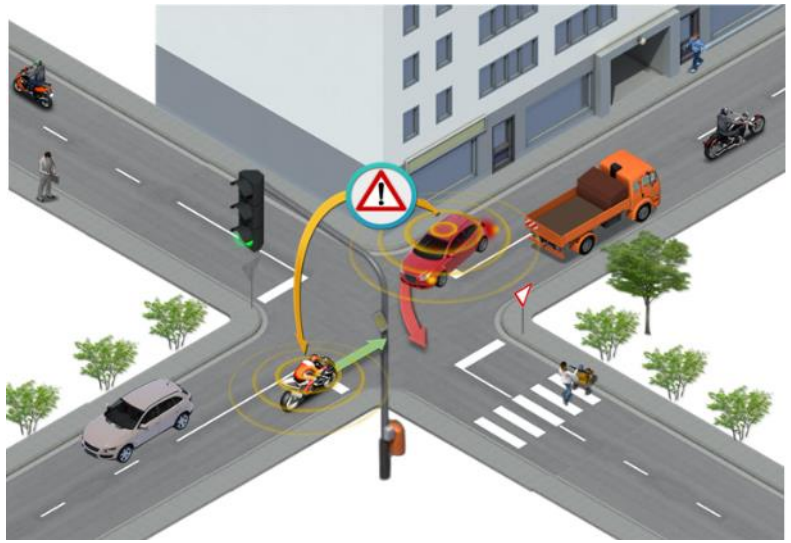
Relevant Use Cases

- Our project is currently deploying 15 use cases. A few are highlighted below.

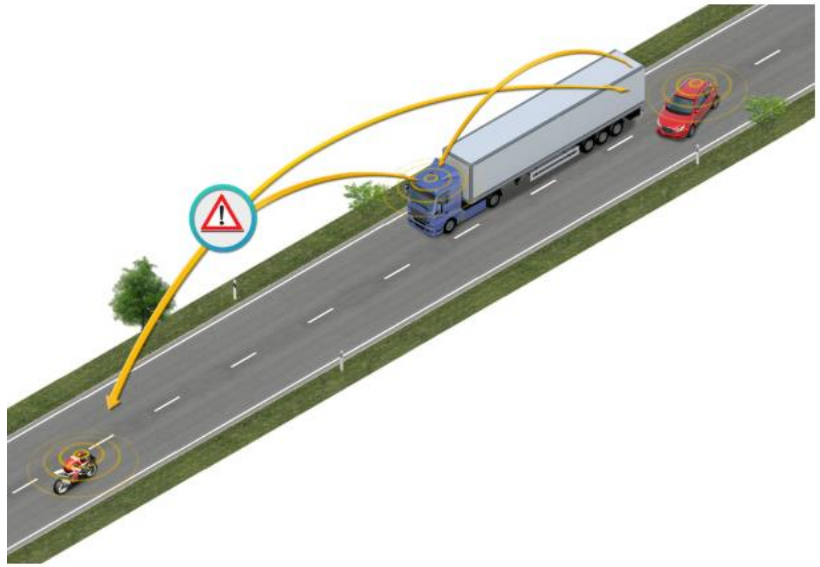
- Driver-Facing Use Cases that Support Riders
  - SPaT-Enabled Intersections for VRU Identification
  - Emergency Vehicle Preemption
  - Every Day a Game day
  - Hurricane Evacuation Support and Incident Response

- Future Rider-Facing Opportunities
  - Curve Speed Warnings
  - Planned Construction and Special Events
  - Adverse Weather & Flood Warning Alerts
  - Wrong Way Drivers
  - Red Light Indication

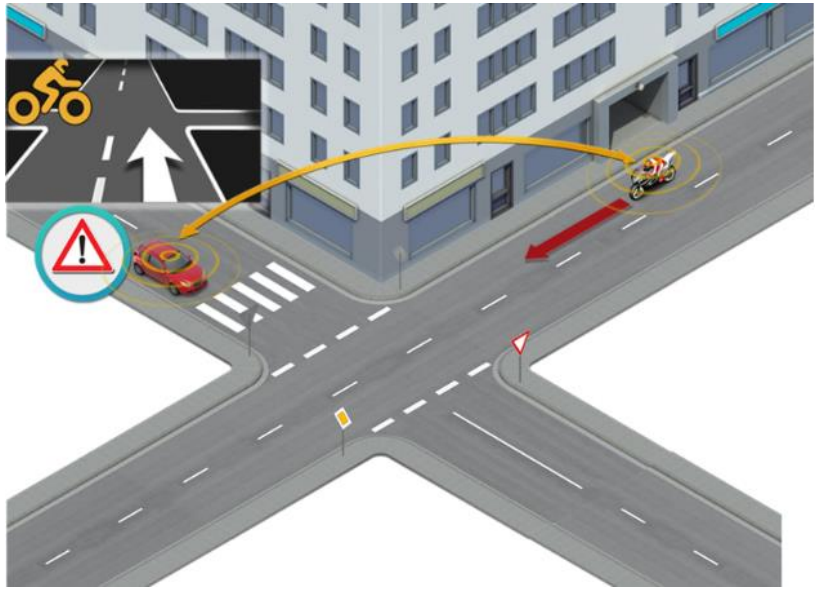
Other Use Cases Identified Outside of TRUST



Left Turn Assist



Do Not Pass Warning



Motorcycle Approach Warning

What riders have told us so far:

In 2022, a federal report explored how Intelligent Transportation Systems (ITS) could enhance motorcyclist safety. The insights below reflect feedback from focus groups conducted as part of that effort.

What Felt Promising:

- Faster Reaction Times
- Build Confidence in Novice Riders
- Preventative Measures for Unforeseen Safety Scenarios

What They're Unsure About

- Overreliance on Technology
- Warning Overload & Distraction
- Rider Interaction
- User Acceptance

THANK YOU!

Want more project updates and information? Contact Me!

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