# Bike Wheel Display

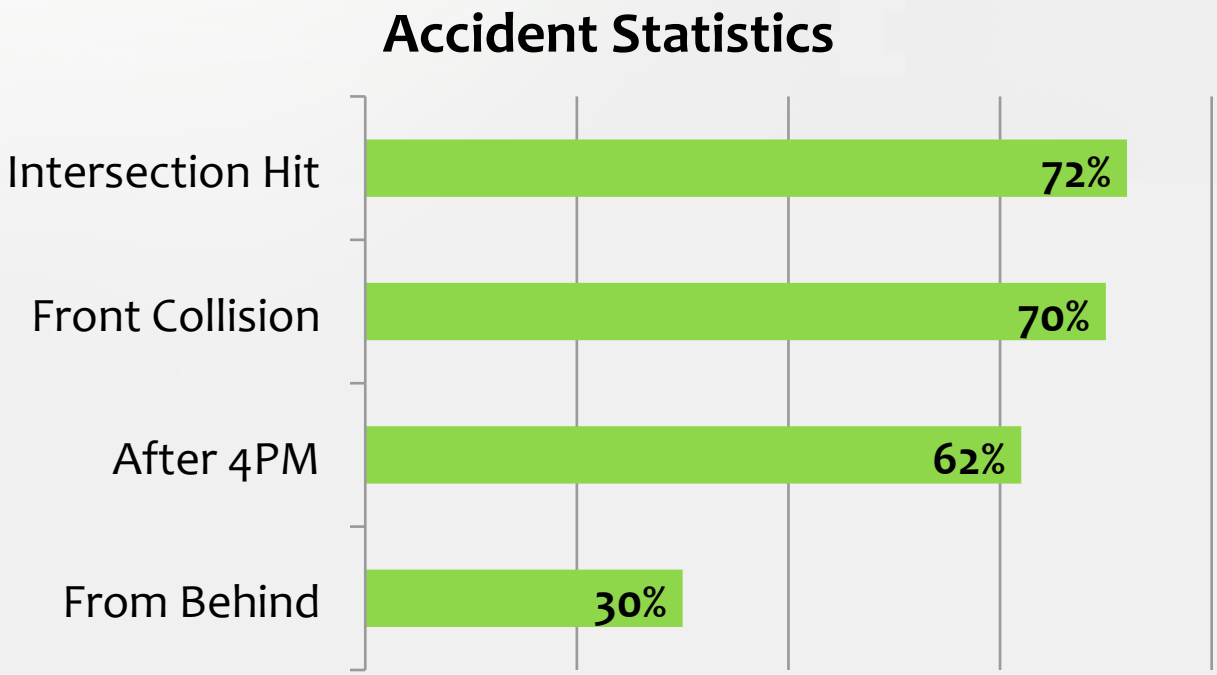
Sketch Model Review

10/6/11

Green A

# Problem

- In 2009, there were **630** pedalcyclist traffic-related fatalities.




Source: Light & Motion Market Data

# Proposed Solution

## Bike Wheel Display

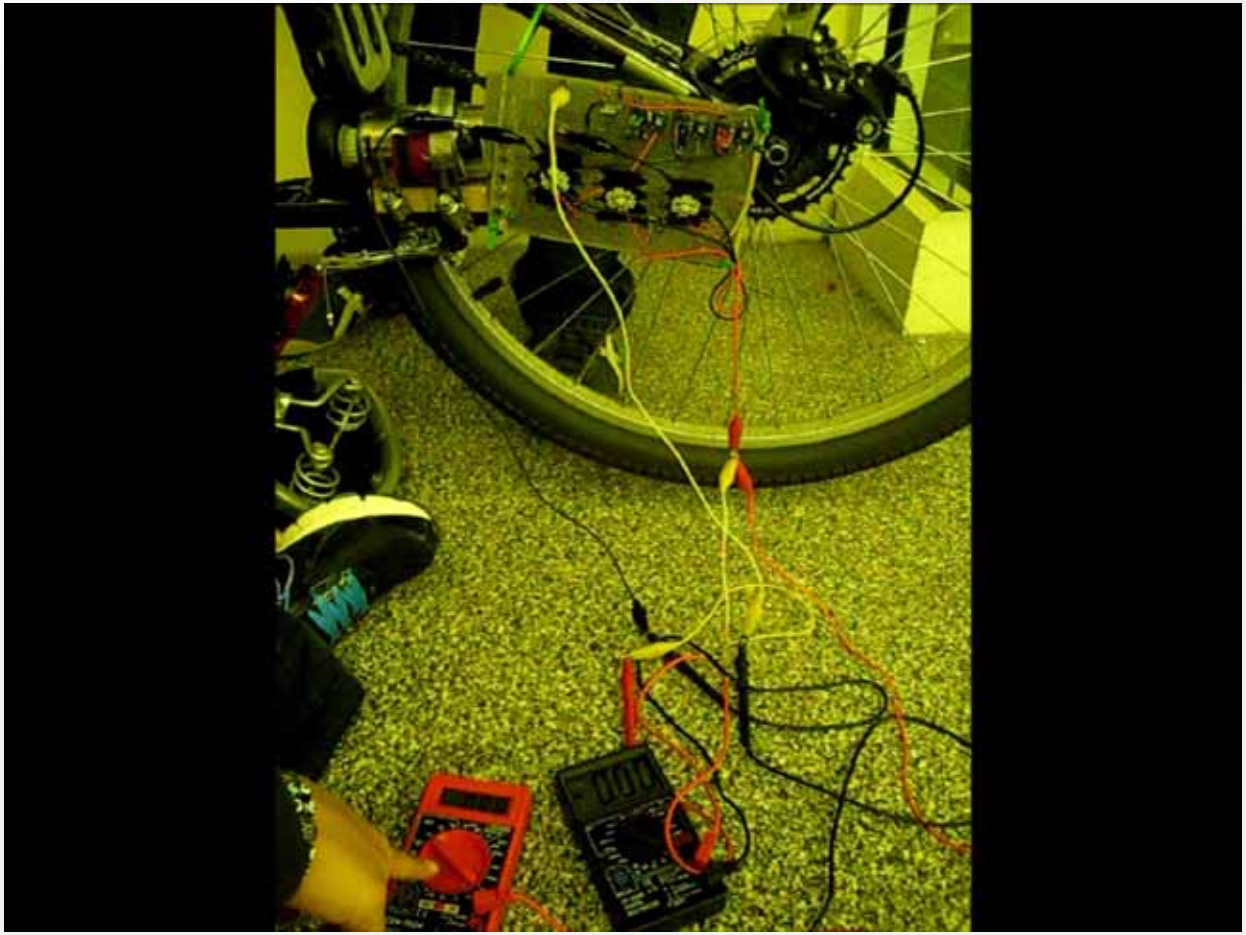
- A union of safety and personalization
- Self-generating power

# Sketch Model

→ Is **regenerative power** sufficient for high visibility at a sustainable cyclist output?

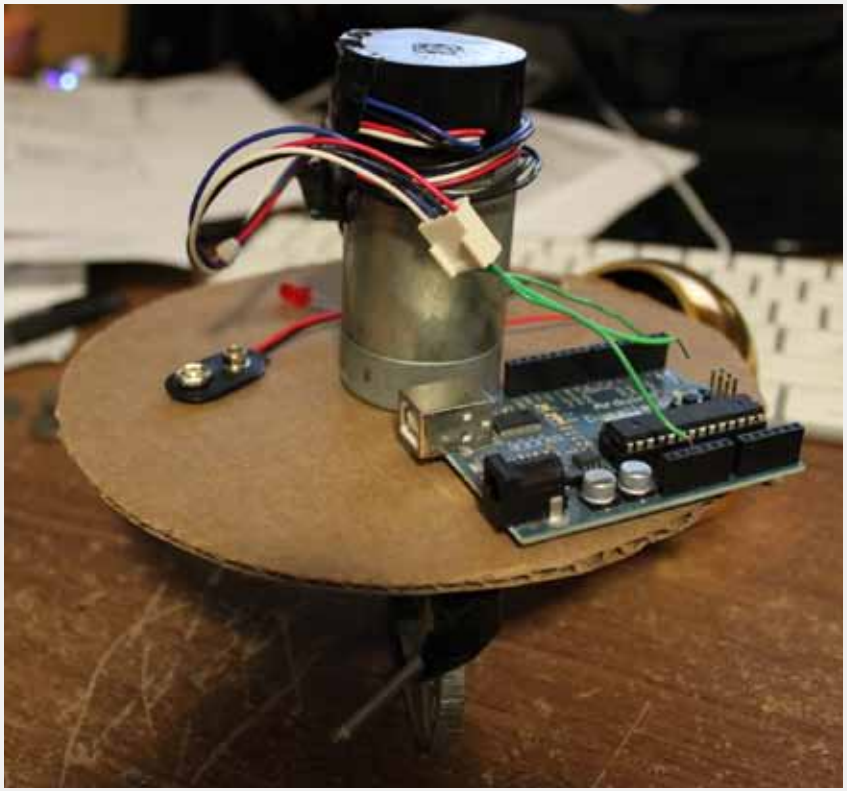
→ How can we guarantee a **consistent image** on the wheel?

# Proposed Solution - Power



# Proposed Solution – Positioning

- Encoder provides exact angular position
- Microcontroller determines appropriate LED output



# Current Market - Benchmarking




| | Conventional LED Bike Lights | Monkeylectric | Project Aura | Us |
|---|---|---|---|---|
| **Cost** | $20-$700 | $65 - $2000 | N/A | TBD |
| **Market** | 20 million bikes sold in US in 2010 | | | |
| **Power** | Battery-Powered | Battery-Powered 3 AA Batteries – 48 hours on low power | Self-generating Hub Dynamo + Slip Ring | Self-generating Bottle Dynamo ~6W |
| **Image** | N/A | Patterns & Images, Function of speed | Function of speed | Patterns & Images, Function of speed |

Sources: National Bicycle Dealers Association, www.surg2011.tumblr.com, www.monkeylectric.com

# Conclusion

- (0.5 Amps)(12 Volts) = 6W Power requirement
- Microcontroller and hall effect sensor encoder is sufficient to generate POV display
- **What's Next:** Lower RPM, Optimize Light Intensity, Scale up POV capability