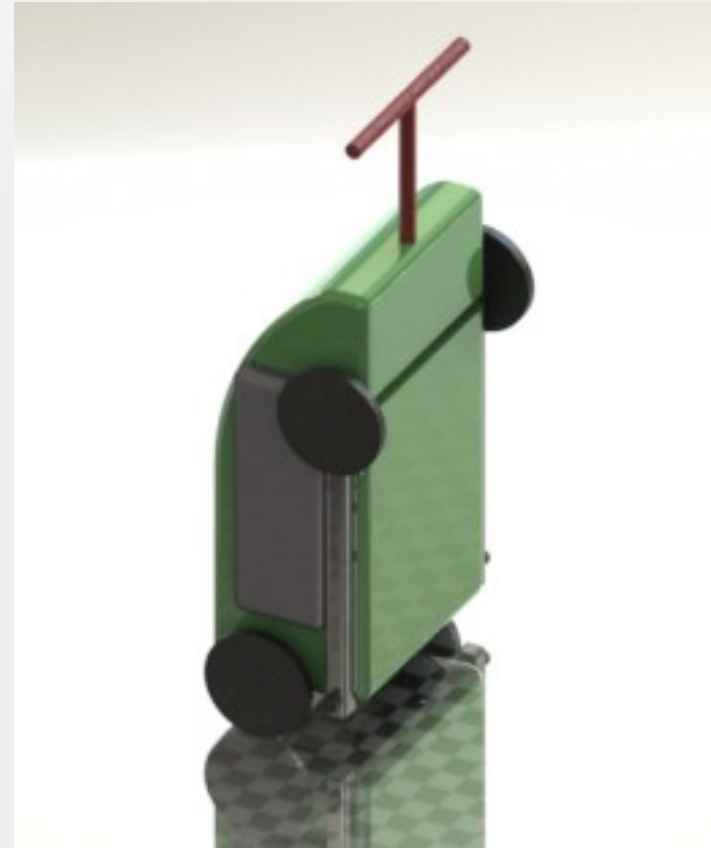
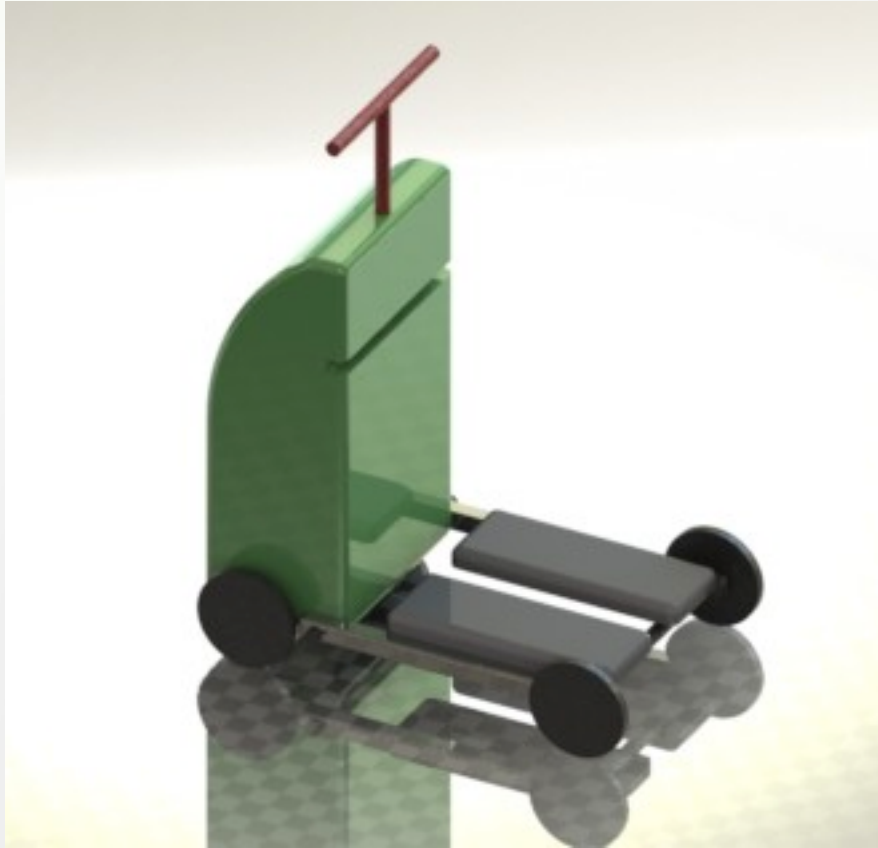


# Scuiter

Mockup Review  
10/20/11

Green A

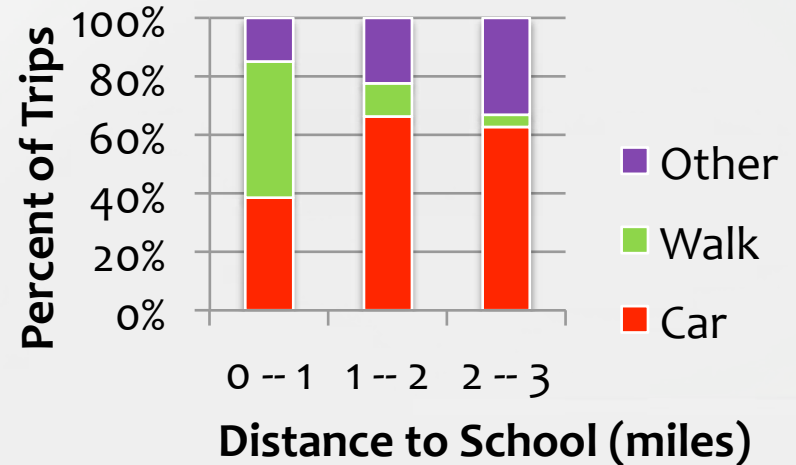
# Scuiter



Green A

# Market

- ✓ 40% of 9.6 Million students (Ages 5-15) <1 mile from school walk to school<sup>1</sup>
- ✓ Users: Students



- ✓ Wheeled Backpack Sales (U.S.) - \$7.91 Million (2009)<sup>2</sup>
- ✓ Customer – Parents

<sup>1</sup> National Household Travel Survey 2009

<sup>2</sup> Travel Data Association (2010), The 2009 Report on Children's Backpacks on Wheels: World Market Segmentation by City

# Product Contract

| Consumer Need   | Product Attribute(s) | Engineering Specifications  |
|---|----------------------|---|
| Fast conversion time from scooter to backpack                     | Assembly Time        | <15 seconds   |
| Not too heavy   | Weight               | < 10 lbs.   |
| Does not tip over easily  | Balance/Stability    | $\frac{N_{BackWheels}}{F_{weight}} \leq \frac{1}{2}$ , at a 20° incline |
| Has a lot of room for supplies, materials                         | Capacity/Size        | 2000 in. <sup>3</sup> < Size < 2500 in. <sup>3</sup>                    |
| Needs to have a robust braking system                             | Stopping Distance    | Stopping distance <15 ft. with actual test speed of 10mph               |
| Can be used for extended period of time; not an ephemeral product | Durability           | 800 full charges on Lithium Ion battery before replacement is needed    |
| Long battery life   | Battery Lifespan     | 10 mile range   |

# Pricing

|                             | <b>Standard Backpack<br/>(JanSport Classic Backpack)</b> | <b>Rolling Backpack<br/>(JanSport Driver 8)</b> | <b>Evoluggage concept<br/>(Kick Scooter &amp; Backpack)</b> | <b>Razor Electric Scooter – E100 Model</b> | <b>Scuiter (Motorized scooter &amp; Rolling Backpack)</b> |
|-----------------------------|--|---|---|--|---|
| Weight (without books, etc) | 12 ounces  | 4 pounds, 3 ounces                              | 6.5 lbs   | 29 lbs                                     | 9 lbs   |
| Capacity                    | 1,551.2 cubic inches                                     | 2100 cubic inches                               | 1420 cubic inches   | N/A  | 2000 cubic inches   |
| Dimensions                  | 13 x 16.7 x 8.5 inches                                   | 19.5 x 13 x 8 inches                            | N/A   | 32.5 x 16 x 36 inches                      | 22 x 14 x 9 inches  |
| Price                       | \$25   | \$120   | \$90  | \$150                                      | [Competitive]   |

# Mockup Model



- Steering Control
- Foldability
- Drivetrain Weight

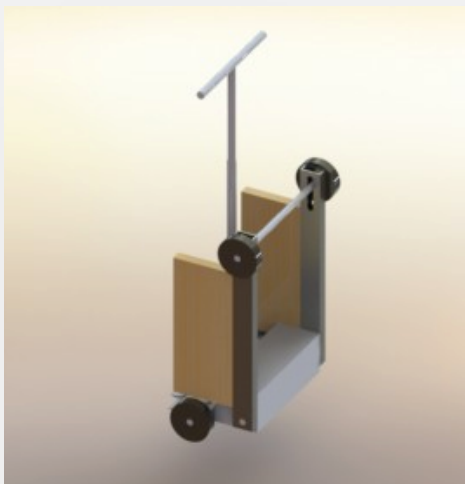
# Key Risk #1: Steering Control



- Currently using a 1 D.O.F. 4 bar linkage mechanism.
- Steering works!
- Challenge: storage room in the backpack area.



## Key Risk #2: Foldability – Time & Ease



- Currently using a side-wall folding mechanism.
- Storage space efficient and easy to use
- Challenge: Sturdiness of the platform.



## Key Risk #3: Weight of Key Drivetrain Components

| Component    | Mockup Weight (lbs)       | Target Weight (lbs) |
|--------------|---------------------------|---------------------|
| Battery      | 5 (2 Lead-acid batteries) | 3                   |
| Motor        | 2.875 (Single 150W motor) | 3                   |
| <b>Total</b> | <b>7.875</b>              | <b>6</b>            |

Green A

# Next Steps

- Space-efficient steering mechanism
- Fast and user-friendly conversion mechanism
- Drivetrain Components selection (battery pack, motor)
- Material selection for a sturdy and lightweight chassis
- Safety testing (stability, braking distance)