

## Team #10: Cool Motorized Scooter for Teenagers

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### Objective Statement

A student at St. Lillian Academy requires mobility assistance. Team #10 aimed to design a “cool motorized scooter” unlike current mobility aids for individuals with physical limitations.

### Engineering Specifications

Metric	Target	Achieved
Top Speed	5 mph	5 mph
Total Weight	≤55 lbs	63 lbs
Battery Life	2.7 hrs	2 hrs
Weight Capacity	375 lbs	350 lbs
Dimensions (l x w x h)	3.5 x 2.5 X 3.6 ft	3.7 x 2.5 X 3.1 ft
Stowing Time	<30 s	24 s

### Safety Components

Remote Kill Switch	Electrical Safety Box
Safety Fuse	Supplied PPE
Lift Handles & Rolling Transport	Self-Cooling Motor

### Project Architecture & Design Overview

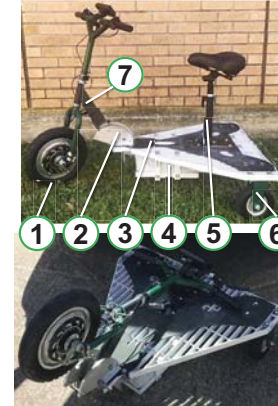
#### Riding Position



#### Collapsed Position



- 1: Front Hub Motor
- 2: Collapsing Bracket
- 3: Decorative & Grating Plates
- 4: Electrical & Battery Box
- 5: Collapsible & Adjustable Seat
- 6: Rigid Casters
- 7: Handlebars, Fork, & Downtube

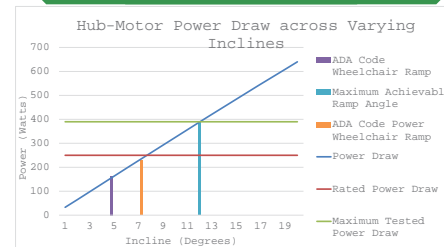


### Manufacturing Process

- **Waterjet:** Decorative Plate
- **Band Saw:** Downtube & Grating
- **CNC:** Bracket
- **MIG Weld:** Downtube Pin & Bracket
- **Metal Bending:** Aluminum Supports

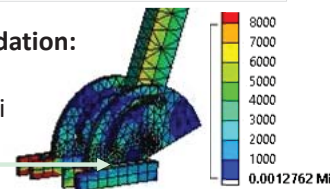


### Engineering Analysis



#### Weld-Joint Validation:

At weld,  
 $\sigma \leq 8000$  psi



### Testing & Validation

Geometry Prototyping



Controller Calibration



Stowing Capability

Client Operability



Kill Switch Range

Brake Stopping Distance

Tipping Threshold

### Budget



- Frame – 31%
- Battery – 14%
- Motor – 19%
- Electrical Accessories – 8%
- Wheels – 2%
- Manufacturing – 2%
- Remaining Funds – 24%

#### August

- Research
- Concept Generation

#### September

- Concept Generation
- Material Selection

#### October

- Material Selection
- Analysis

#### November

- Parametric Design
- 3D Modeling

#### December

- Design Completion
- Order Parts

#### January

- Manufacturing Design
- Design Amendments

#### February

- Manufacturing Design
- Design Amendments

#### March

- Manufacturing Testing

#### April

- Client Tests
- Prototype Completion

#### May

- Distribute to Client