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Jack Team #10: Cool Motorized Scooter for Teenagers St. Lillian Rettig ACADEMY Mason Drouant, Devin Merz, Mon Tapalla, Leah Troskot, Collin Weyenberg, Zachary Zimmer **Objective Statement Testing & Validation Project Architecture & Design Overview** A student at St. Lillian Academy Riding Position Geometry requires mobility assistance. Team #10 1: Front Hub Motor Prototyping aimed to design a "cool motorized 2: **Collapsing Bracket** Controller 3: **Decorative & Grating** scooter" unlike current mobility aids for Calibration Plates individuals with physical limitations. 4: Electrical & Battery Box Stowing 5: Collapsible & Adjustable **Engineering Specifications** 1 2 3(4) 5 Capability Seat Collapsed Position 6: **Rigid Casters** Client 7: Achieved Metric Target Handlebars, Fork, & Operability Downtube Top Speed 5 mph 5 mph Kill Switch **Total Weight** ≤55 lbs 63 lbs Range **Battery Life** 2.7 hrs 2 hrs **Engineering Analysis Manufacturing Process** Brake Weight Capacity 375 lbs 350 lbs Stopping Hub-Motor Power Draw across Varying \rightarrow MIG Weld: → Waterjet: Distance Inclines Dimensions 3.5×2.5 3.7 x 2.5 Decorative Plate Downtube Pin & ADA Code Wheelchair Ramp X 3.6 ft X 3.1 ft (|x w x h)→ Band Saw: Bracket Maximum Achievable Tipping Ramp Angle Downtube & → Metal Bending: <30 s 24 s ADA Code Power Threshold Stowing Time Grating Aluminum Wheelchair Ramm → CNC: Bracket Supports **Safety Components** Budget 7 9 11 13 15 17 19 Mayimum Tested Power Draw Incline (Degrees Frame – 31% Remote Kill Electrical Safety 8000 Weld-Joint Validation: Batterv – 14% 7000 Switch Box 6000 Motor – 19% At weld, \$2500 5000 Safety Fuse Supplied PPE Electrical Accessories – 8% 4000 $\sigma \leq 8000 \text{ psi}$ Wheels – 2% 3000 Lift Handles & 2000 Self-Cooling Motor Manufacturing – 2% 1000 Rolling Transport Remaining Funds – 24% 0.0012762 Min October December August September November January February March April May • Material Concept Manufacturing Client Tests Research • Parametric Design Manufacturing Manufacturing • Distribute to Concept Generation Selection Design Completion Design Design Prototype Client Testing Order Parts Material Selection Analysis 3D Modeling Amendments Amendments Completion Generation Sponsor: Elissa McKenzie 2017-2018 Advisor: Dr. Warren Waggenspack, Jr