

Project Proposal: E-Bike Conversion Kit

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CLIMATE CHANGE

INCREASING CARBON EMISSIONS

ECOLOGICAL FOOTPRINT

INCREASING DEMAND FOR ECO-FRIENDLY
TRANSPORTATION OPTIONS



Problem :

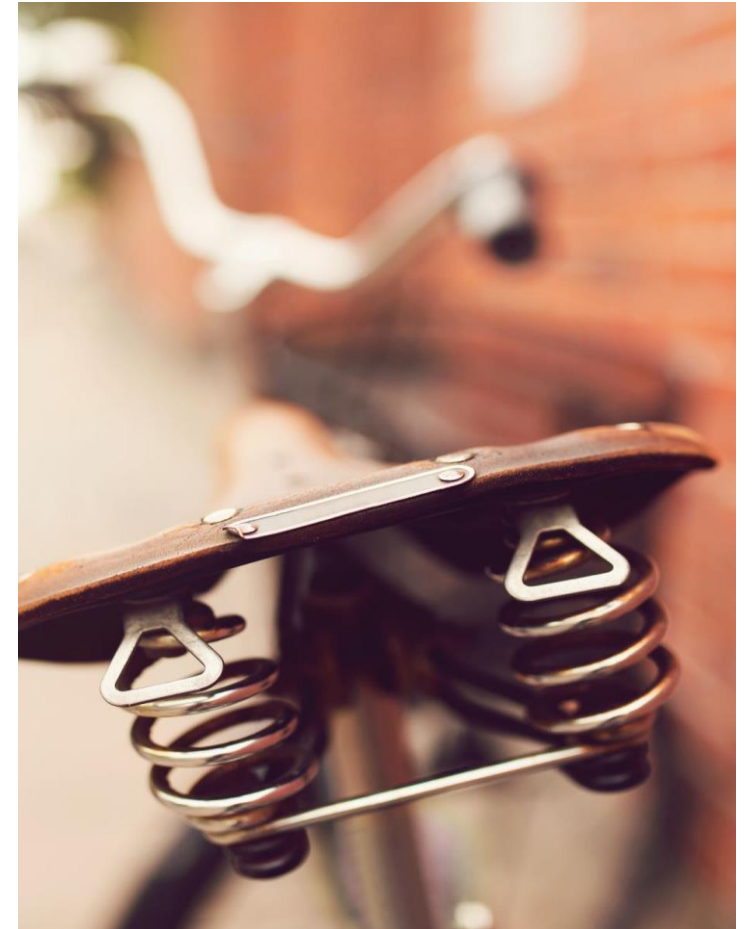
- ▶ Environmental waste from unused bikes
- ▶ New E-bikes are costly
- ▶ Current conversion kits are not user-friendly



Proposed solution:

E-Bike Conversion Kit

- Converting a regular peddle bike into an e-bike
- Utilizes an already existing bike
- Easy to install, user-friendly design
- Relatively low cost



Benchmark:

Specialized Turbo Levo Hardtail

Specialized Turbo Levo Hardtail:

- ▶ 250w electric motor
- ▶ Battery capacity of 460Wh
- ▶ \$3,699.00 CAD

Our conversion kit:

- ▶ 250-500w electric motor
- ▶ Battery capacity of 460Wh
- ▶ Up to \$1,849.50 CAD



Mechanical components:

Mechanical Drive System

- ▶ The motor will be placed on a rack over the rear wheel.
- ▶ Weight and torque will be accounted for and calculated.
- ▶ Factor of safety.

How the motor will connect:

- ▶ Through a chain from the motor to the wheel.



Mechanical components: Control electronics/batteries enclosure



- ▶ Enclosure that sits on a rack above the rear wheel
- ▶ Secure enclosure for the parts
- ▶ Keeping majority of parts out of sight

Mechanical components: Mounting equipment

- ▶ Mounted to seat and rear wheel
- ▶ Requires no alterations to the bicycle
- ▶ Analyzed with CAD/inventor



Electrical Components:

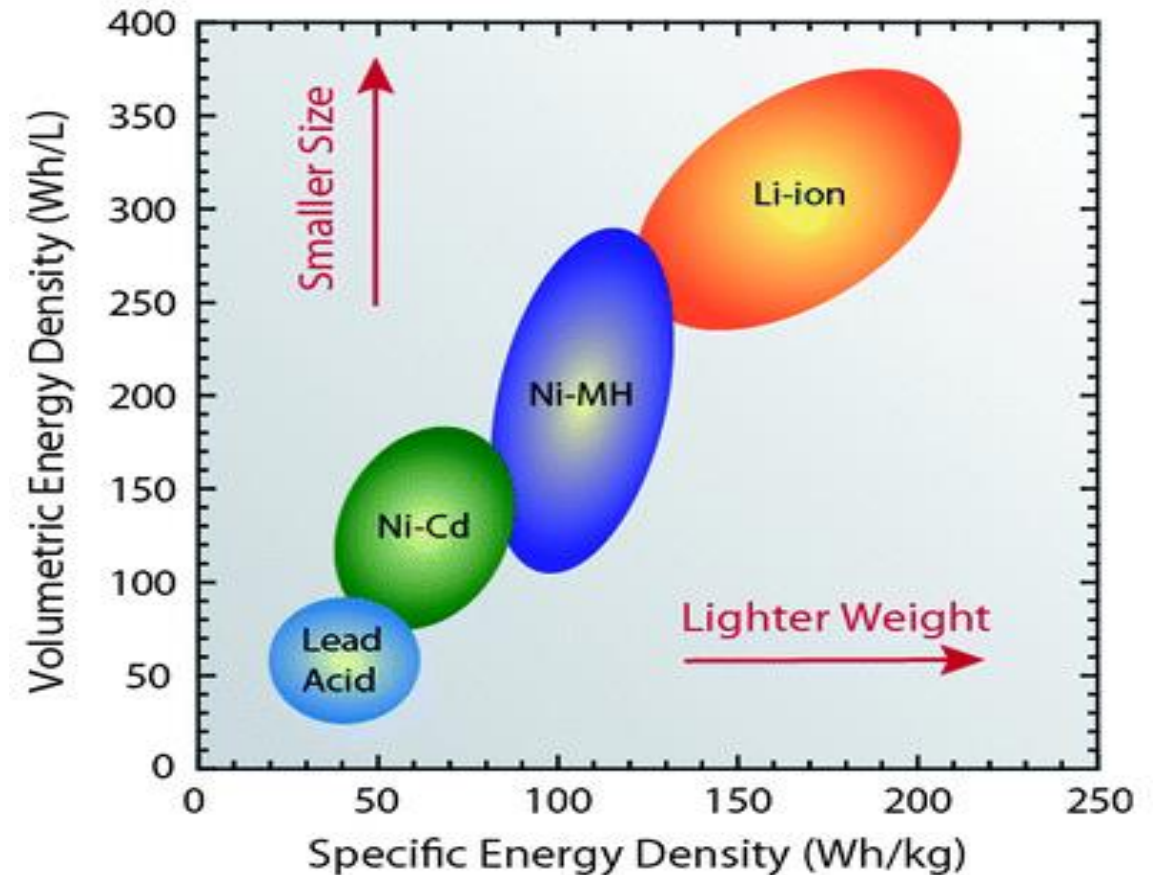
Electric Motor & Controller

- ▶ Selecting the electrical components for an e-bike is crucial for a well-functioning design
- ▶ The Nova Scotia legislation states, power must be less than 500W
- ▶ Brushless DC Motor
 - ▶ No maintenance
 - ▶ Efficient speed control
 - ▶ Speed Controller Required



Electrical Components: Batteries

- ▶ Four Main Options:
 - ▶ Lead-Acid
 - ▶ Nickel-Cadmium (Ni-Cd)
 - ▶ Nickel-Metal Hydride (Ni-MH)
 - ▶ Lithium-Ion (Li-ion)



Electrical Components: (Controls / Sensors)

- ▶ Acceleration/ Throttle:
 - ▶ Resistive Potentiometer
 - ▶ Analog Buttons and Switches
 - ▶ Digital Display
- ▶ Speed Measurement:
 - ▶ Hall Effect Sensor



E-Bike Concept :



<https://bit.ly/31iOmWc>

Proving our concept:

- ▶ Real world testing
 - ▶ Recording Range
 - ▶ Charge Times
 - ▶ Capability
- ▶ Location: St. Francis Xavier Football Field



Design Restrictions & Assumptions:

- ▶ Our design can be scaled up
- ▶ Limited budget of roughly \$400
- ▶ Designed for dry weather conditions, & smooth roads



References:

- ❖ All references to information in this PowerPoint can be located at the end of the project proposal report.

Questions...

