Electric Bike Kit
Christian Nonol, Hector Hernandez, Jacob Hubner, Jinju Philip, Sadad Reza, Tariq Mohammed

Overview:
The electric bike kit is intended to provide an efficient mode of transportation for 5-10 miles, which is a typical daily commute distance. The kit comprises a small battery, a brushless motor, and a controller with variable speed control. The main outcomes of the project indicate the successful application of design concepts to a real-world problem in sustainable transportation.

Problem Statement:
Electric bikes are expensive, making them less accessible for a large group of customers. They can also be hard to install, which can be a barrier for people who want to convert their existing bikes into electric bikes. Furthermore, some electric bike designs are bulky which makes it difficult for people to store or transport their bikes.

Design:
- Throttle and LCD
- 36V 22A Controller
- Bike donated by TTU Surplus
- Battery Pod Dewalt 12V 6Ah
- 750W 48V Hub Motor

Calculations:
- Capacity:
  \[ 36V \times 6Ah = 216 Wh \]
- Range:
  \[ \frac{216 Wh}{15 Wh/\text{mi}} = 14.4 \text{ miles} \]
  - Assuming the power consumption is 15 watt-hours per mile. Using pedaling in combination with 50% throttle.
- Maximal unloaded speed (only using throttle):
  \[ 400 RPM \times 60 \times 0.001289 \text{ mi} = 30.936 \text{ mph} \]
- Approximate loaded speed:
  \[ 30.936 \text{ mph} \times 0.7 = 21.6552 \text{ mph} \]

Results:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Price</strong></td>
<td>$370.36</td>
</tr>
<tr>
<td><strong>Total Range</strong></td>
<td>~ 13 miles</td>
</tr>
<tr>
<td><strong>Top Speed</strong></td>
<td>20 mph</td>
</tr>
<tr>
<td><strong>Assembly Time</strong></td>
<td>1 hour</td>
</tr>
<tr>
<td><strong>Charge Time</strong></td>
<td>3 hours</td>
</tr>
</tbody>
</table>