

## Electric Bike Systems Selection Matrix

|   |  | DD Hubs   | Geared Hubs  | Mid Drives  |   |
|---|--|---|--|---|---|
|   |  | General Benefits, Uses and Limits   |  |   |   |
| <b>Specific Category of Electric Bike Uses</b><br><i>* Top Priority Factor, imo</i> | <b>Description</b>   | <b>Pros:</b><br><i>*Silent.</i> Good Thermal performance on flats. Wound for torque, high speed or in between. Best for reliability. Some with controllers built in. Good efficiency on flats. Independent drive trains allows variable cadence.<br><b>Cons:</b><br><i>*Unsprung wheel weight.</i> Heaviest per watt. Poorer center of gravity. Poor thermal on hills. Difficult to change flat tire. | <b>Pros:</b><br><i>*Good starting torque, acceleration.</i> Lowest weight because of gear reduction. Lower visual profile. Center of gravity ok. Independent drive trains allows variable cadence. Good torque sensors allow a decent ride experience.<br><b>Cons:</b><br><i>*Lower top speeds for same voltage per DD or Mid.</i> Lower efficiency at high speeds due to internal gears. Reduction gear wear vs DD hub. Slight noise. Less thermal performance because less metal to remove heat. | <b>Pros:</b><br><i>* Lower center of gravity making it the best handling and more like a regular bike.</i> Efficient from low to high speed, on flats and hills. Best efficiency for hills, off road. Typically can get longer range on road than hubs. Less weight because of gear reductions. Very good torque through all gears. No un sprung wheel weight for better handling and easy flat change. Moderate thermal performance.<br><b>Cons:</b><br><i>*Low to high pitch noise.</i> Chain/gear wear needs more replacement maint, less reliable. Mid drive limits cadence range, making experience more tedious. 2-step reductions harder to pedal. (except Optibike) More gear shifting. | <b>Major Brand Suppliers</b>  |
| <b>Specialty Uses</b>   |  |   |  |   |   |
| Cargo   | Utility use.   | NO  | YES  | YES   | NTS Works, Stoke Monkey, Yuba   |
| Fat Tire  | Fun for beach and snow or to be cool.  | YES   | YES  | YES   | Pedego, Optibike, Surface   |
| Recumbent/Trikes  | Special three wheel applications   | YES   | YES  | YES   | Outrider, Pedego  |
| Affordable  | Price point of \$1500 or below. Quality not expected.  | YES   | NO   | NO  | Prodeco, e-Joe, Motiv, eZip   |
| Kits  | The DIY way.   | YES   | YES  | YES   | Bionx, Falco, Eco speed, Golden, BMC, E-bike, Bafang  |
| <b>Common Styles and Uses</b>   |  |   |  |   |   |
| Cruiser   | Bike cruiser designs, upright, big tires. Casual use around neighborhood, on bike paths, errands.  | YES   | YES  | NO  | Pedego, IZIP, Ford, Hebb, OHM, Easy Motion  |
| Light Mountain  | Light Trail riding. Bike will have front suspension, disk brakes, geared hub or mid drive more common. 26, 27.5 and 29ers. Centered battery a must.  | YES   | YES  | YES   | Easy Motion, Optibike, Haibike, Focus, E3   |
| Heavy Mountain  | Heavy trail riding, abuse expected. Higher quality components. Full suspension expected. Quality disk brakes. Centered battery and mid drives only. High powered bikes and longer range preferred. | NO  | NO   | YES   | Optibike, Haibike, Stealth  |
| Mini Commuter   | 20" wheels models. Foldable light.   | YES   | YES  | NO  | e-Joe, Easy Motion, Kalkoff, Yike, Prodeco  |
| City Commuter   | Most common category. Frame must have braze ons for racks/fenders.   | YES   | YES  | YES   | Specialized Turbo, Eflow Nitro, Izip Dash, Optibike, Stromer, Grace, Easy Motion, Kalkoff, OHM, Hebb, Ezee, Giant |
| Road Commuter   | Built for speed. Speeds of 25-30+ attainable with assist. Carbon material use is common. Bikes expected to be light weight and under 45lbs.  | YES   | YES  | YES   | Easy Motion, Optibike R11, Haibike, Eflow flight, Stromer, Specialized  |
|   | <b>Major OEM Suppliers</b>   | Eflow, Izip, Currie, Specialized, Stromer, Stealth, Kalkoff/Focus, Grace, Prodeco, Pedego, Volton   | Easy Motion, Ezee, Hebb  | Optibike, Haibike, Kalkoff, E3  |   |