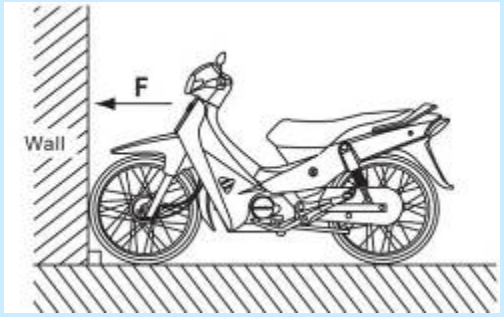
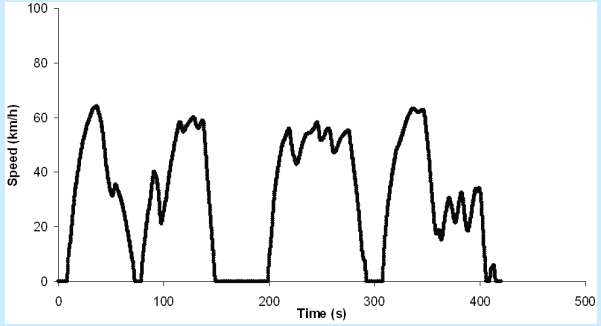
Light Duty Electric 2-3 Wheelers

Dr. Horizon GITANO
Focus Applied Technologies
Electric Vehicle Test Center

Prospects for SE Asia
Issues and Opportunities





Electric 2-3 Wheelers: Immensely Popular

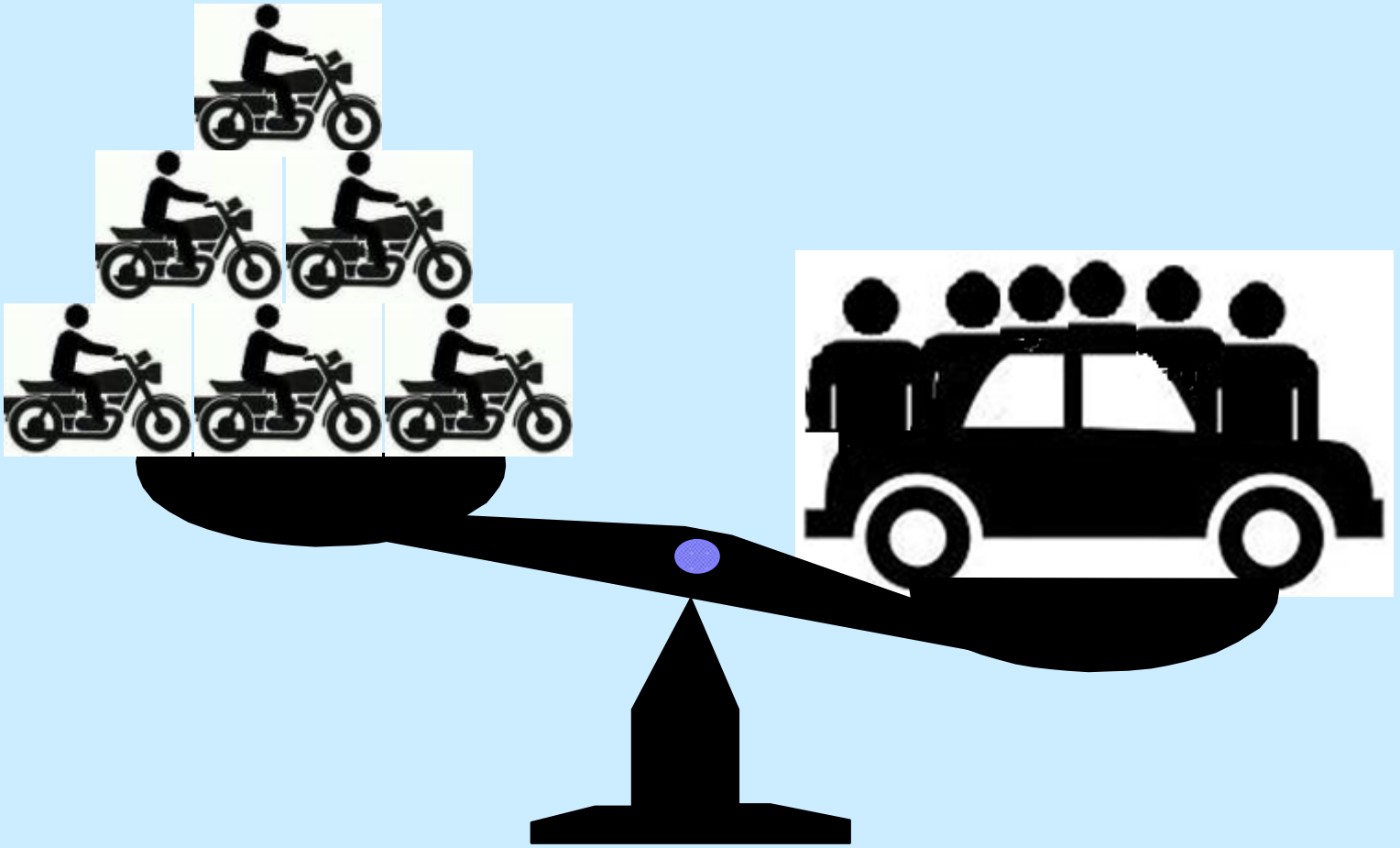
~500,000 on the roads in SE Asia
~35 kph, ~30km range (*Not motorcycle equivalent*)
Used for short urban trips (Work, Shopping, School)
Rural uses include commuting to field/orchard

Reasons for Popularity

- Inexpensive compared to motorcycles (400$ vs. 1000$)
  (only in the short run, long term costs are same or more)
- Convenient for low-speed, short trips
- Can easily store/charge indoors
- "No need helmet, license, registration" mentality
- Disproportionately used by very old/young and immigrants
- Currently not tracked by most governments

Electric 2-W Efficiency Comparison

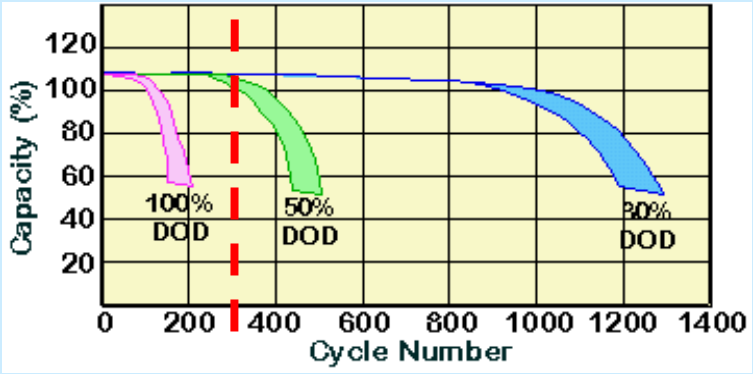
6 guys on 6 e-motors are more efficient than 6 guys in one car!



2-Wheelers are so efficient, their actual efficiency is often overlooked.

Problems: Quality, Road Usage, DATA!

- Poor data on usage/accidents as not generally registered
- 45% of riders had no license
- Almost *none* of the riders wore helmets!
- Speed Conflict with faster traffic
- Competes with public transport



Customer Complaints:

- Battery Life (typically 2-4 years, but can be <1 year)
- Battery Replacement Cost (80% of new vehicle cost)
- Poor/non standard Breaks and Tires
- Overall low quality

Used “Battery dumping” was a worry, but “vehicle dumping” is more common as cost of batteries is almost the same as price of a new vehicle.

SOLUTION #1: Track vehicles and get DATA!

Governments should begin tracking these light dust 2-3 wheeler electric vehicle.

Importation/Manufacturing/sales numbers can be tracked

Police should track statistics of EV related accidents

We started with a survey of existing users with the Malaysian Institute of Road Safety Research (MIROS)

MIROS
MALAYSIAN INSTITUTE OF ROAD SAFETY RESEARCH

SOLUTION #2: Implement Vehicle Standards

To prevent shoddy or dangerous products from “poisoning” the market national standards should be developed covering this class of vehicles.

Fortunately this has already begun: ASEAN EV Manufacturers have been adopting “ASEAN Electric 2-3 Wheeler” standards based on input from the various member states, as well as overseas standards.

Require Helmets/License for speeds >25kph…

The goal of these standards is to insure a minimum level of quality, safety, and compatibility with existing infrastructure, while allowing maximum access to this efficient technology.

SOLUTION #3: Public Education and Labeling

Most of the users of these Light Duty E2-3 Wheelers are from the “Bottom 40%” economically, and the vehicles are chosen “because they are inexpensive”

A closer look at the economics shows that E2W’s are actually MORE expensive per km than conventional motorcycles.

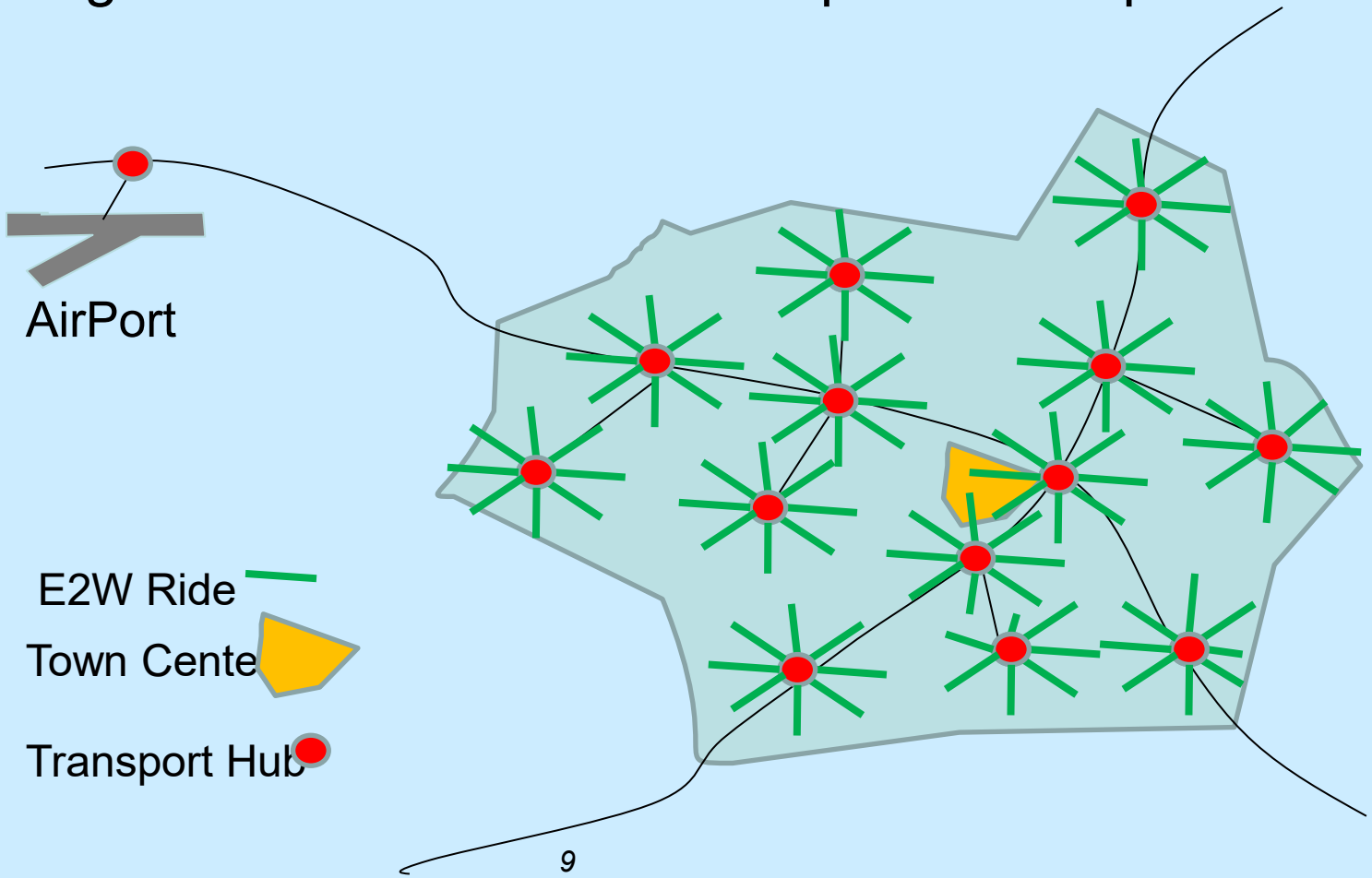
	E2W	E2W+Batt	Motorcycle	MC+Maint	
Purchace Cost	1800	2300	4500	5700	RM
Annual range	1650	1650	5000	5000	km/year
Fuel Cost/year	145	145	220	220	RM
Vehicle Life	4	8	12	12	years
Cost/year	595	433	595	695	RM
Cost/km	0.090	0.033	0.010	0.012	RM

Vehicle Efficiency and Cost (eg. cost per km) labeling can help consumers make prudent decisions

SOLUTION #4: Integrate with Public Transport

The immense popularity of the Electric 2-3Wheelrs in China led to a conflict with public transport.

These make great “first/last” mile links to public transport systems!



Conclusions

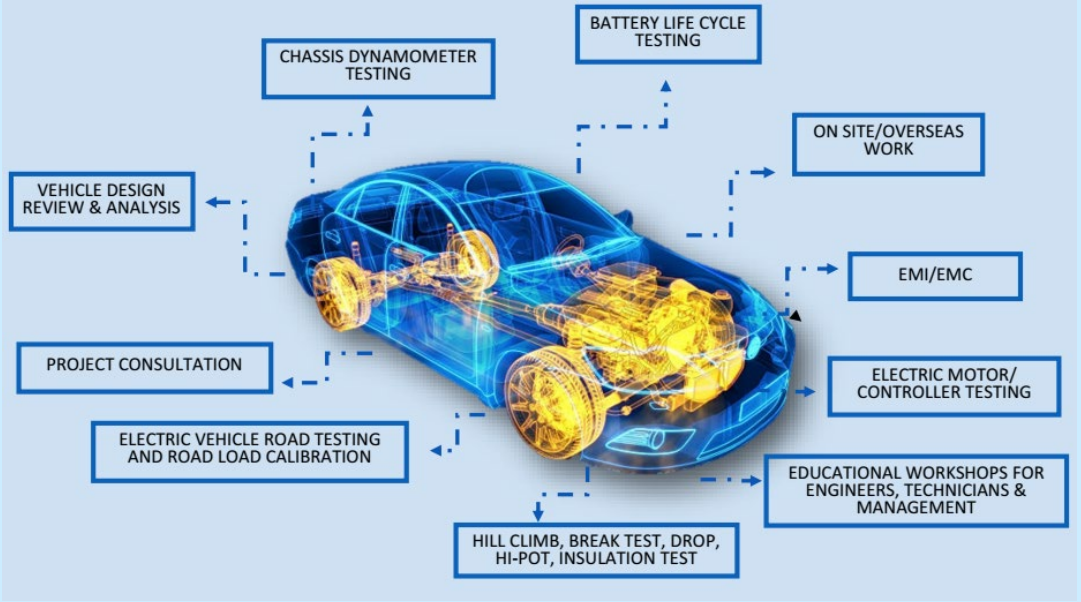
Electric 2-Wheelers are ***exceptionally*** efficient, cheaper to own per year, but are more expensive per km compared to conventional motorcycles

To insure the maximum benefit of this popular and efficient technology we should consider the following:

1) Track vehicle and accident statistics (Data driven policy)
2) Implement National/Regional Standards
3) Educate the public to the advantages and costs
4) Integrate into the existing public transportation system

CONTACT: EV Test & Development

Chassis Dynamometers for 2-3-4 Wheelers, Trucks, Buses…



Vehicle and Transportation
System Consulting
Technical Training

The Electric Vehicle Test Center (EVTC)
Dr. Horizon Gitano-Briggs (CTO)
HorizonUSM@yahoo.com
+(6016) 484-6524
www.FocusAppliedTechnologies.com