



WeatherVelo 'Prime' electric cabin-scooter

Increasing urbanisation

- **pollution**

local air quality, noise, global CO2 emissions

- **congestion**

91% of car commuting is single occupancy

Source: Liftshare UK / Green Thing Ltd.



The need for alternative vehicles

- **cars: overweight, oversize**

e.g. 1000kg vehicle to move 75kg occupant

- **limitations of two-wheelers**

risky (especially when wet), no weather protection



“Small, light and electric
[is] the way to go”

European Commission CARS21

Market forecasts

Four-fold increase in sales of EVs during the coming decade.

Electric **cars** will constitute **less than half** the market value.

Electric two-wheelers and **alternative** vehicle types will **dominate**.

Source: IDTechEx

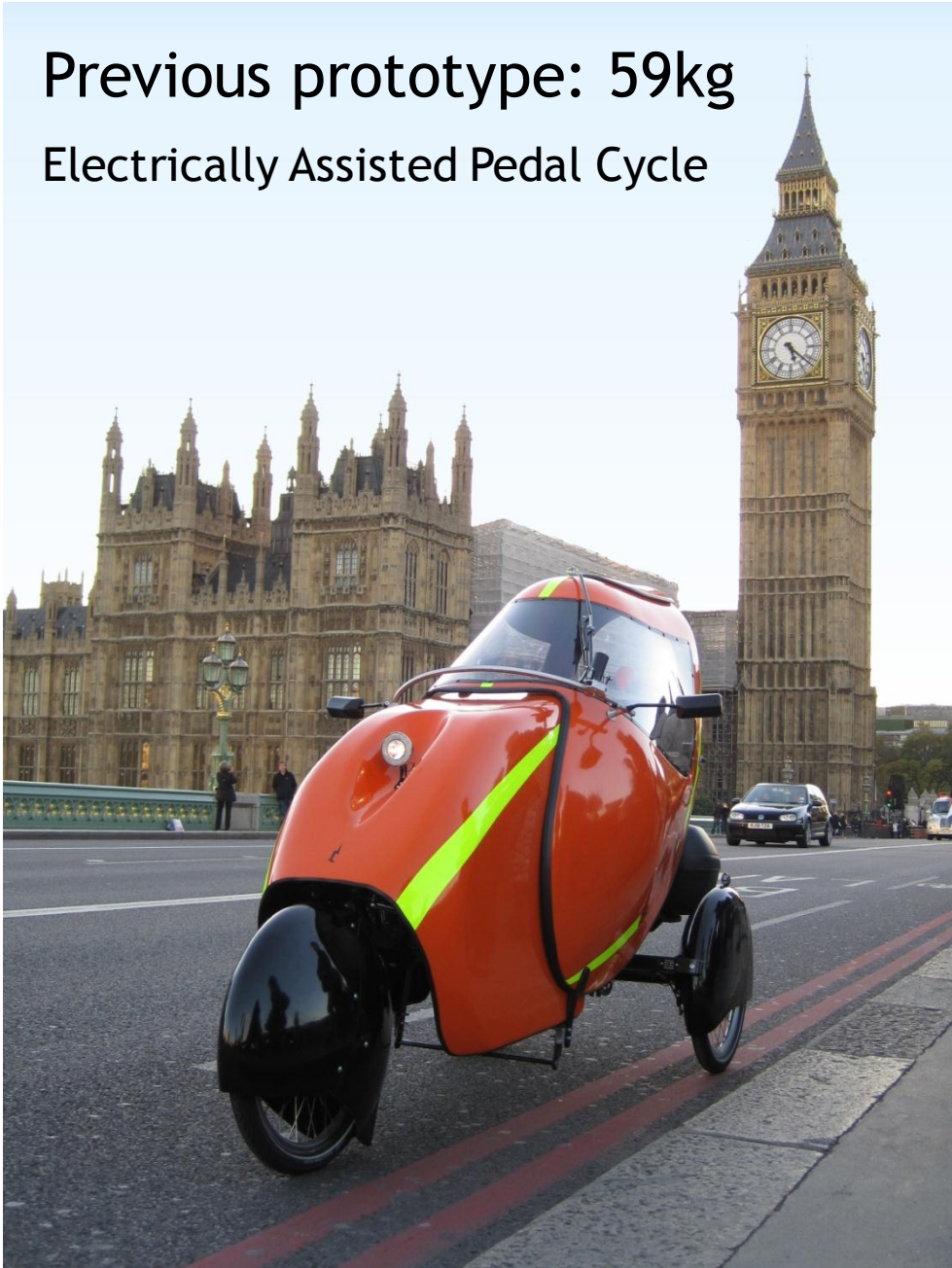


Specifying a vehicle ...?

- legislation
- practicality in use
- environment
- financial
- technical feasibility
- market acceptance



Previous prototype: 59kg
Electrically Assisted Pedal Cycle



Other colours possible!





Building on practical experience
to refine the specification...

- L2e category
licensing, bus lanes, insurance
- very lightweight BEV
one-third the weight of Twizy
- new battery technology
developed in UK, easily recycled
- roofline equivalent to cars
visibility in traffic
- slender + manoeuvrable
urban speeds: tilting unnecessary
- ergonomic steering
unique cable system





WeatherVelo 'Prime'

electric cabin-scooter



Other colours possible!
Zip-in side pieces not shown



- ✓ registered design
- ✓ registered trademark
- ✓ unique vehicle niche
- ✓ early mover advantage

Affordability

“90% of car journeys in cities are under 6km” Michael Cramer MEP

- urban niche
 - ~ fit for purpose
 - ~ not motorways
- battery choice
 - ~ no monthly rental
- other savings
 - ~ no London congestion charge
 - ~ insurance

Target retail price: £3,995



Primary markets

- commuters, local errands
in lieu of single-occupancy cars
- youth (from age 16)
- vehicle sharing schemes
- delivery/courier services
- local government, airports etc.
fleet order could kick-start production





4 Seasons Velos



SCHÖNE *linie*
KUNSTSTOFF GESTALTUNG



LowC^{VP}
low carbon vehicle partnership



...but investment needed!

Routes forward...

- £180k \Rightarrow series production
~ self-jigging chassis, minimal market penetration

Gross added value at 45% of input costs

Turnover projections: 2014 £400k, 2015 £2m, 2016 £3.5m

100 vehicles 500 vehicles 1000 vehicles



- £1.5m investment \Rightarrow volume production
~ tooling costs, better market penetration + CO₂ savings
- major manufacturer takes over project
~ tooling costs, optimal market penetration + CO₂ savings
~ WeatherVelo/colleagues as team-members?



Thank you for listening.

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Supplementary slides

if needed for Q&A

EV comparisons

M1

L6e

L2e

L1e

eBike



Car, M1
e.g. Nissan Leaf

Quadricycle, L6e
e.g. Renault Twizy 45

Three-wheel moped, L2e
WeatherVelo Prime

Two-wheel moped, L1e
e.g. Lexola G3000sx

'Pedelec' bicycle
e.g. UrbanMover UM44S

1521kg, 80kW (Leaf)

445kg, 4kW (Twizy)

125kg, 2kW (tbc)

63kg-145kg (depends on type), 2kW (typical)

24kg (example), 0.25kW

inefficient for one person

moderately efficient

efficient

efficient

extremely efficient

full weather protection

partial doors (Twizy)

full weather protection

no weather protection

no weather protection

plus heater + a/c

when side pieces fitted

177cm wide (Leaf)

124cm wide (Twizy)

80cm wide, tapers front + rear

highly manoeuvrable (but vulnerable)

ultimate manoeuvrability

gets stuck in (and causes) traffic

full width front + rear

plus allowed in signed bus lanes

plus allowed in signed bus lanes

cuts through traffic, causes none

motorway speeds

45km/h (L6e version)

45km/h

45km/h

25km/h

inherently stable

inherently stable

inherently stable

inherently unstable

inherently unstable

Avoiding pitfalls of Sinclair C5



Bigger/taller, faster, roof + windscreen, sides (not shown)

Displaced (well-to-wheel) emissions, prototype #1:

UK generation mix: 524.6g CO₂ per kWh

Motor draws 0.43kW
cruising at 28mph (45 km/h) on the flat

$524.6\text{g} \times 0.43\text{kW} = 225.6\text{g per hour}$

At 45km/h = 5g/km CO₂

