..Product Investigation..

To gain a deeper insight into existing pushchairs, I looked at one my friend uses, noting it's abilities and features.
By having access to a travel system and being able to test the different functions and examine the mechanisms up close, I gained a better understanding of existing products than I had when researching online or in a shop. I could also see the product being used in context with real people.

Observations:
The 3-in-1 Silvercross (£250) transforms from a pram with 'babynest' seat unit, to a pushchair. The sides of the seat unit fold down and cover attachment is removed to extend the unit when the child has grown. The seat is then attached at an angle where the child can sit in the unit, rather than lying when in pram mode. An attachable car seat is also included.

There is a storm cover which can be pulled all the way over, or unzipped to function as a sun shield.

A safety bar is clipped in with a spring loaded push button. Belts and clips keep the child safe in the seat.
A basket underneath is clipped in for storage.

The brake system is located at the back of the pushchair. Press down on the main bar to brake and press down on the levers above the wheel to lock them in place.

Steer lock is available on the front wheels. When the lever is pushed down the wheels will roll in a straight line forward and back.

..Ease of Disassembly..

Step 1:
Grip levers on handle bars and pull upwards to unlock holding mechanism at front.

Step 2:
Pull upwards on part below handle bars, which closes in behind seat.

Step 3:
Push buttons on front wheels and push in towards seat.

Step 4:
Pushchair is full folded and secure for movement.

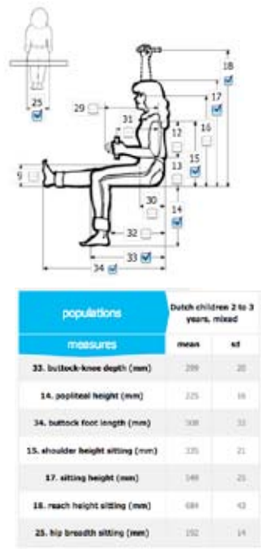
..User Review..

I asked the user some questions in order to help me learn from issues and develop my own product:

Owns this one 3-in-1 pram/ pushchair, but also grandmother has one, grandfather has one, parents in law have one. Planning to buy a more lightweight stroller soon.

Pram mode lasted 0 - 6 months.
Car seat lasted 0 - 9 months.
Pushchair has lasted 6 - 21 months (so far).
Issues - heaviness, hassle to switch between modes.

..Average Child Anthropometry..



populations	Dutch children 2 to 3 years, mixed	
measures	mean	sd
33. buttock-knee depth (mm)	299	20
14. popliteal height (mm)	225	16
34. buttock foot length (mm)	308	33
15. shoulder height sitting (mm)	335	21
17. sitting height (mm)	548	25
18. reach height sitting (mm)	684	43
25. hip breadth sitting (mm)	252	14

I researched anthropology in order to refine the dimensions of my product. I looked at average arm height for women, in order to define the handle bar height, baby height and breadth, as well as child sitting dimensions from ages 2-5.

The data was a little inaccurate as UK statistics were difficult to find. Belgium data is similar to the UK apparently, so I used this. I also took measurements of Lily, 21 months. By having figures I could progress with my design further, although to accommodate all ages I realised I would have to make the product extremely adjustable.

..Materials and Manufacture..

I looked at the life cycle of a pushchair and identified areas where I could improve the sustainability of the product. By using a small range of materials, aluminium and HDPE or ABS, they can be recycled. If cast or extruded, parts are less complex to manufacture and less energy is used, hence improving sustainability. If the item can fold up as well as reducing parts, savings can be made on packaging and transportation/distribution energy. The main opportunity here is to extend the useful life of the product, and I can do this by giving it a 'new life' every time it is transformed. This in turn can reduce the number of life cycles by reducing the number of different products.

I established that because I was effectively reducing the life cycle by a factor of 6, by combining 6 products in to 1, I could justify the use of some more complex mechanisms and manufacturing processes. This was essential in a product which was very difficult to design functionally. I should have considered the fact that parts would be simpler if they were extruded, but was determined to work out the folding mechanism of the frame, and developed parts which would probably have to be cast rather than extruded.