



Case Study

Gordon Murray Design

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Gordon Murray Design, of Formula 1 and McLaren fame, has developed a new concept for a low-cost automotive process and product, the T.25. They claim it “represents a major breakthrough in City Car design and is a vehicle that has been optimised through design for strength, performance, weight, cost, safety, usability, tooling, quality, energy efficiency, recyclable and ease of assembly.”

Murray’s firm, which collects revenue from auto-design consulting, has spent about £ 30 million since 2007. It raised US \$ 12 million from Mohr Davidow Ventures and £ 4.5 million from the Technology Strategy Board, a UK government-backed research group, to help develop the prototypes.

The T.25 is a micro city car powered by a modified three-cylinder 660cc Smart engine, and the T.27 an electric variant. These vehicles are designed to demonstrate a new efficient method of car manufacture, called iStream.

iStream Production Process

“Essentially, we’ve been making motor cars the same way since the Model T, and that model is breaking down,” Murray claims.

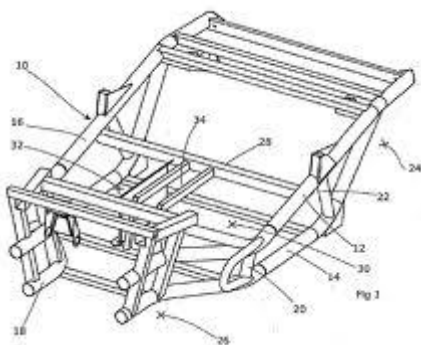
The process centres on a separate body chassis assembly process. The assembly process is separate. During the first part, the powertrain, wiring harnesses, brakes, suspension and all major components can be fitted directly onto the chassis prior to the body panels being fitted. At the heart of Murray's iStream system is a cheap, re-cycled lightweight composite material, which is used to make the chassis, onto which components and plastic body panels are installed. Three steps – stamping the steel frame, welding the body together and rustproofing – are eliminated.

The body panels are delivered to the line pre-painted, and bolted to (rather than welded or glued) the completed chassis near the end of the assembly process, helping to reduce paint damage normally associated with a standard assembly line.

Pre-painted body panels mean that there is no need for a paint shop in the assembly plant which removes the complications associated with VOC emissions. Mechanical fixing of body panels is quick and low-energy. It also makes future repairs relatively simple as replacement panels are quicker and easier to fix.

The construction method allows the chassis to be scaled in size for different products, with each new design requiring only low-cost tooling and software changes. This flexibility means that the chassis can be used as a standard 'platform' to deliver different vehicle types and model variants e.g. car, urban delivery van, taxi, emergency support vehicle. This process also makes cosmetic repairs cheaper and easier, and also potential future updates to external panels to suit customer preferences.

Murray has estimated that a manufacturer could build an iStream plant to make 100,000 cars annually for 85% less capital than a conventional one.



T.25 & T.27 Vehicles

The T.25 and T.27 each seat three people instead of two, with the driver placed in the middle ahead of the two passengers. The cars weigh only 550kg, half that of other city cars, but have passed the European Union crash-test requirements. The T.25 is powered by a frugal 3-cylinder petrol engine, and the T.27 by a 25KW motor and lithium ion battery. Both cars feature:

- High fuel economy and low environmental impact.
- Ease of parking, at 90 degrees to the curb, or up to 3 cars in one parallel parking space.
- Low insurance costs due to ease-of-repair.

Murray says he has conducted exploratory discussions with ten car companies and five other businesses to license iStream.

T.25 TECHNICAL SPECIFICATION



SPECIFICATION	
• Length:	2.4m
• Width:	1.3m
• Height:	1.6m
• Weight:	575kg.
• Turning circle:	6 metres.
• Fuel capacity:	30 litres.
• Engine:	3 cylinder - low friction - all aluminium. 4 valve variable valve-timing - 660cc. capacity.
• Power:	51 Hp @ 7000 rpm.
• Torque:	57 Nm @ 4000 rpm.
• Transmission:	Semi-auto sequential 5 speed.
• Chassis:	Tubular steel with cored composite structural floor.
• Body:	Upcycled plastic panels.
• Active safety:	ABS - ESP - Traction Control.
• Passive safety:	Air bag - front & rear crush zones occupant safety cell - anti-side intrusion system.
• Suspension front:	Strut & wishbone & anti-roll bar. Independent.
• Suspension rear:	Strut & V Arm - ilink. Independent.
• Anti-pitch:	Control systems on both axles.
• Steering:	Unassisted rack & pinion.
• Luggage:	160 litres - 720 litres.
PERFORMANCE	
• Top Speed:	156kph - restricted to 145kph.
• 0-62 mph:	16.2 secs.
• Economy:	74mpg combined - 3.83ltr/100km.
• CO ₂ :	86gms/km

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Questions

Apply the elements of the low-cost airline business model and process to assess the viability of this project, including:

1. Process - iStream;
2. Products – T.25 and T.27cars;
3. Business model.

Sources:

<http://www.gordonmurraydesign.com/t25.php>

http://www.youtube.com/watch?v=kO_PZ8yEDcl

<http://www.autocar.co.uk/car-review/murray/t25/first-drives/murray-t25>