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Transport is complex

Supply / demand tension plus many additional pressures.

Traditional 'remedies' are reduce demand [pricing and legislation] and increase supply [more infrastructure].

Intelligent Transport Systems (ITS) can increase supply without building more infrastructure

The mega-trends (not just transport)

- **Digitisation**
- **Affordable & powerful mobile devices**
- **24/7 connectivity**
- **Smartphones, computers and vehicles are data collection devices**
- **Open Data is transforming transport markets**
- **Service Provision displacing Asset Management**
- **Digital systems that react faster than humans**
- **Vehicles becoming hardware controlled by software, not *vice versa***

ITS

Combine

- Information Technology
- Communications
- Sensors
- Maps and Databases

To deliver mobility that is

- More efficient
- Safer
- “Greener”
- More comfortable

For all modes

Where is ITS technology lacking ?

- Rapid electric vehicle charging ↔ battery technology; Inductive charging
- Making infrastructure ‘smart’ for asset management and condition monitoring
- Developing pathways to high automation *via* connected vehicles
- Cheaper sensors
- 5G & telephony matching transport needs
- Secure connectivity of vehicles and “Internet of Things”
- H₂ distribution networks and fuel cells

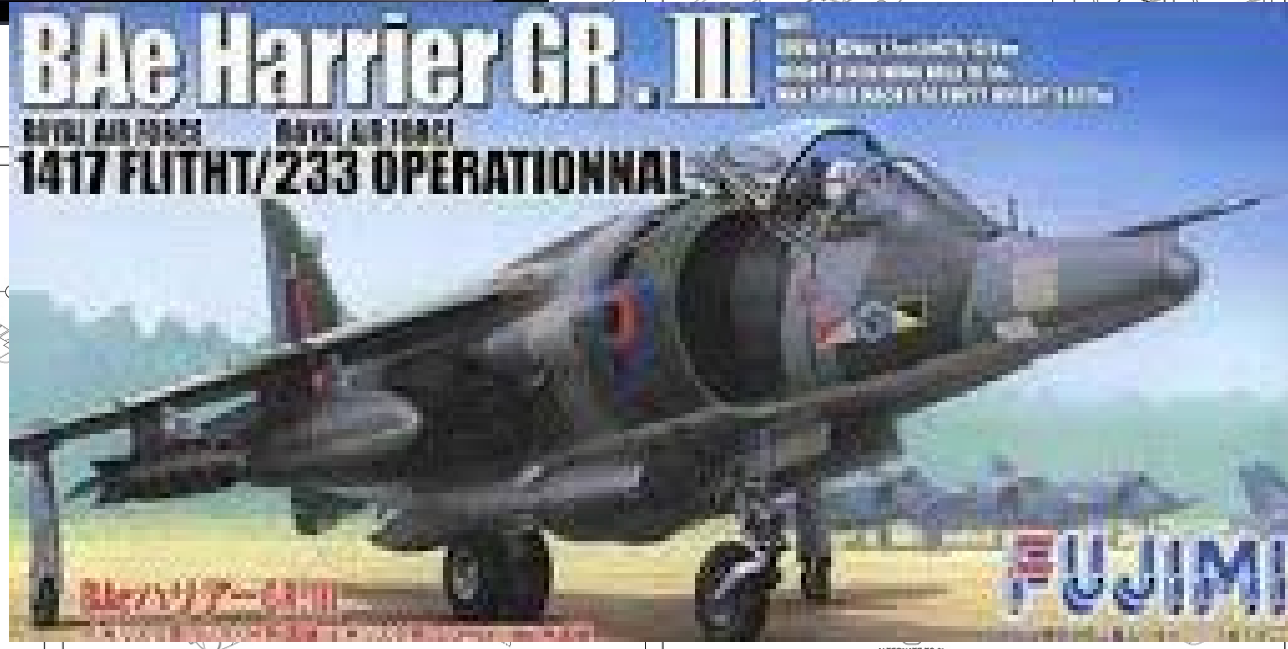
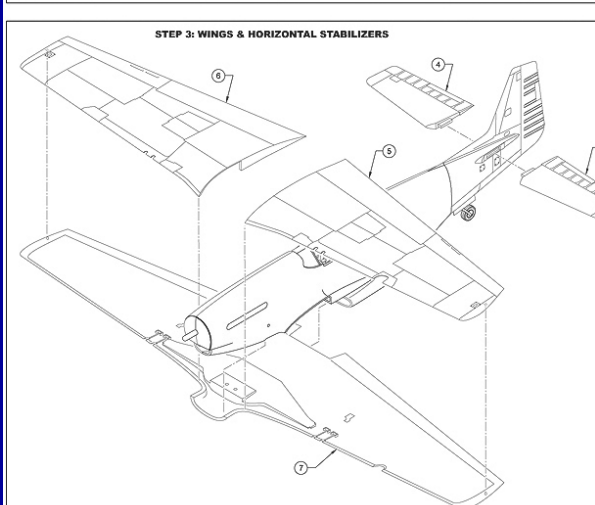
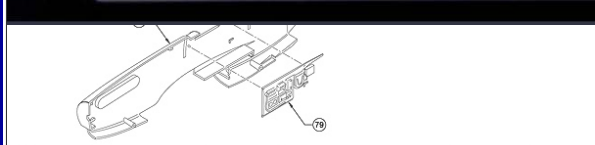
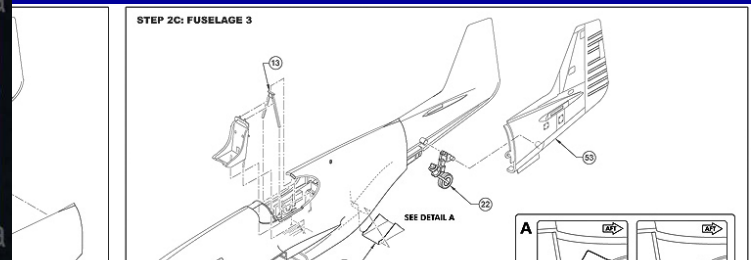
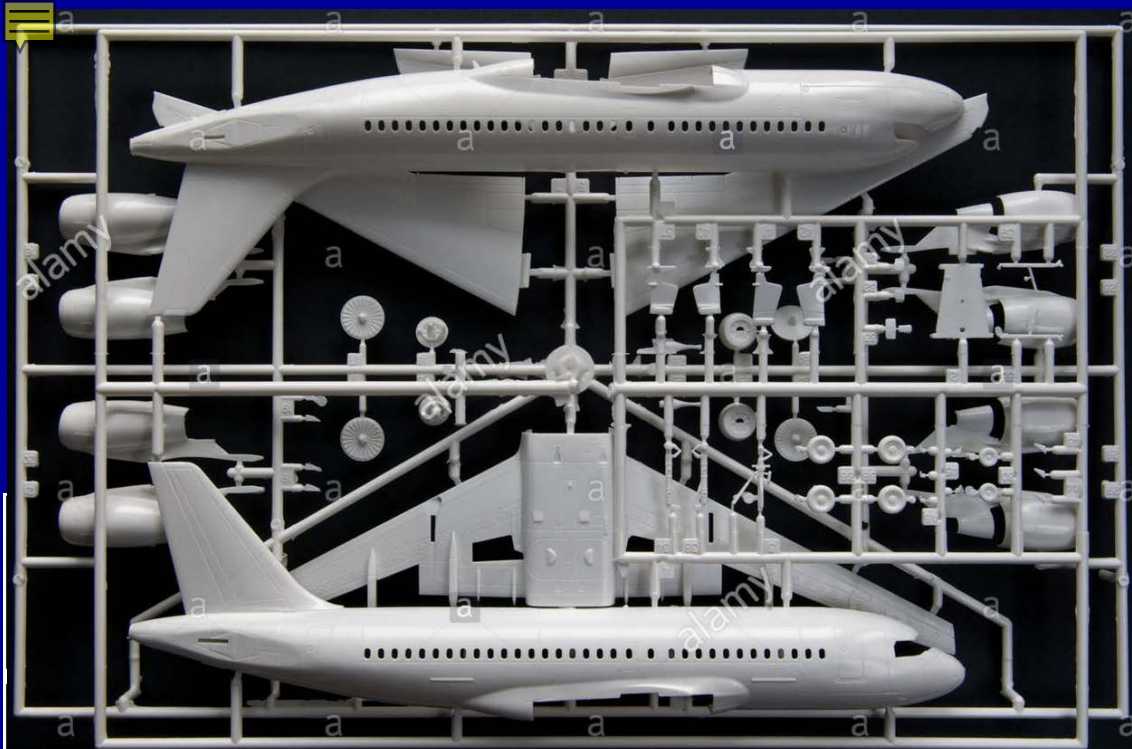
What else is missing ? 1

Understanding:

- **Future transport demand and its likely impact on conventional tax revenue**
- **Driver behaviour, distraction and underload**
- **Vehicle emissions in real-world driving**
- **That Connected vehicles [C-ITS] are here now and can deliver substantial benefits faster and more cheaply than driverless**
- **The impact of highly automated vehicles on congestion, parking, safety, tax income**
- **The role of drones in transport**

What else is missing ? 2

- Standards in many areas eg mapping
- Cost-benefit data on ITS deployments
- Wider cooperation between automotive companies and infrastructure operators
- Liability & institutional frameworks for highly automated vehicles [HAVs] in mixed traffic
- Experience of small [$\approx 5\%$] quantities of HAVs in conventional fleets
- More trials of highly automated freight vehicles eg “platooning”
- A common European strategy on connected AND highly automated mobility



ALTERNATE TO RL

