

Traffic dynamics

- Model traffic flow on **single lane** freeway with **bottleneck**
- Established model: *Intelligent Driver Model*
 - Each vehicle's acceleration determined by gap to leading vehicle, speed difference, ... → **ODE**
 - Observation: Formation of **stop-and-go waves** around bottlenecks
 - Can instability still be observed at low speeds?
- Planned extension: **traffic light**
 - **Forced** stop-and-go waves
 - Vary green light period
 - **Interaction** with natural instability?
 - Resonance possible?
 - Optimal switching frequency?



Image: Tim Ireland/PA Archive/Press Association Images



Image: <http://www.etatrust.org.uk>