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## Nomadic device design and use



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- ITS - Nomadic Device Definition
- Ergonomics & Human Factors
- Design Guidance Progress
- Basic Considerations
- Issues
- Examples

# MIRA's ITS knowledge supports the four key areas of specialist engineering competence



**Low  
Carbon  
Technologies**



**Intelligent  
Transport  
Systems**

**Autonomous  
Vehicles**



**Defence**

## Definitions - 1

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- **ITS** = Intelligent Transport Systems
- **Ergonomics** = Ergonomics (or human factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance (IEA)
- **Human Factors Engineering** = The science of understanding the properties of human capability and applying this to the design, development and deployment of systems and services
- To all practical purposes the latter two terms can be seen to apply to the same knowledge and skill base

- **Ergonomics** has been widely applied in the design, development and research into transport. Objectives are to enhance :
  - **Safety**
    - Short, Medium and Long Term, both Passive and Active
  - **Comfort**
  - **Usability**
  - **Comprehensibility**
    - Information
  - **Marketability**
- New technologies bring new challenges
- In particular a move from new technology being “part” of a new vehicle design to technology being brought to the vehicle by the user = nomadic devices

## Definitions - 2

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- What is a Nomadic Device?
- No formal “legal” description, but....
- ***Nomadic Device Forum*** - eSafety Support (EC)
- Nomadic devices include all types of information and communication as well as entertainment devices that can be brought into the vehicle by the driver to be used while driving. Current examples are mobile phones, portable computers, Pocket PCs, PDAs, mobile navigation devices, iPods, DVD Players and future multi-functional smart phones.
  - MF Note : “to be used while driving” ?
  - MF Note : A principal concern is that uncontrolled development, deployment and use of NDs may have negative impacts on safety by causing driver distraction

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## ■ ***Nomadic Device Forum - eSafety Support (EC)***

- The importance of a safe human machine interface (HMI) for all information and communication devices when used in a vehicle and for mobile systems in particular has been stressed many times in resolutions, opinions and conclusions by several European institutions. On one side, the HMI working group of the eSafety Forum was updating the European Statement of Principles of 2001 for safe installation and use and delivered its recommendations by February 2005. This resulted in an EC Recommendation by end of 2006. On the other side, the NDF was first set up under the AIDE project to offer a communication platform for the many different stakeholders to discuss the implementation of the new ESoP via a voluntary agreement.
- [http://www.esafetysupport.org/en/esafety\\_activities/esafety\\_working\\_groups/nomadic\\_device\\_forum.htm](http://www.esafetysupport.org/en/esafety_activities/esafety_working_groups/nomadic_device_forum.htm)

- Concerns on the potential for “unsatisfactory” ND designs, and in particular the Human Machine Interface (HMI), of such NDs led to a number of actions.
- In the UK the DfT commissioned a study to develop a design guidance handbook for system developers
- This eventually became BSI DD235 (Issued 6/96) and then superceded (Withdrawn 5/07)
  - Gives recommendations for important safety related issues to be addressed by designers, manufacturers, suppliers and installers of in-vehicle information systems that could be used by drivers whilst driving.
- Other member states took this as a lead as concerns were shared
- Eventually EC accepted a proposal to draw together a consensus view document from UK, D, F and SW attempts

- A Task Force was proposed (UK) and convened (SW, D, F & D, NL, UK) and systematically reviewed the national guidance documents
- **European Statement of Principles on Human Machine Interface for In-Vehicle Information and Communication Systems (5/98)** - Recommendation C(1999) 4786 12/99
- Subsequently expansion on this document was undertaken within the EC eSafety initiative and resulted in
- **On safe and efficient in-vehicle information and communication systems : Update of the European Statement of Principles on Human-Machine Interface** - Recommendation C(2008)1742 final
- The BSI standard was subsequently withdrawn
- However these are recommendations and NOT requirements

# Design Guidance from EC

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- Format
- Overall Design Principles
- Detailed Sections relating to design and use
- Overall Objective to guide designers in forming the physical design and operability characteristics of NDs
- This is a European level guidance document
- But without a legal mandate
- So how is it being used today?
  - Checklists?
  - Design Manual
  - Occasional Reference?

# Examples

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- Concept Development
- Design and Implementation
- TSB Project **Foot-LITE**
- A SMART driving application
- Implemented on a SmartPhone
- Novel and innovative HMI
- Embodies broad design principles
- Currently under trial
- To be completed

- Research
- Impacts of ND on drivers and driving
- EC Project **TELEFOT**
- Multi-Site Trial across EC
- In UK we trial SatNav and SMART Driving NDs
- One “familiar” and one “novel”
- Cross EC comparison
- Analysis on thousands of drivers behaviour

# Thank You

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