

# **Integrating RUC with UTMC: Benefits and Challenges**

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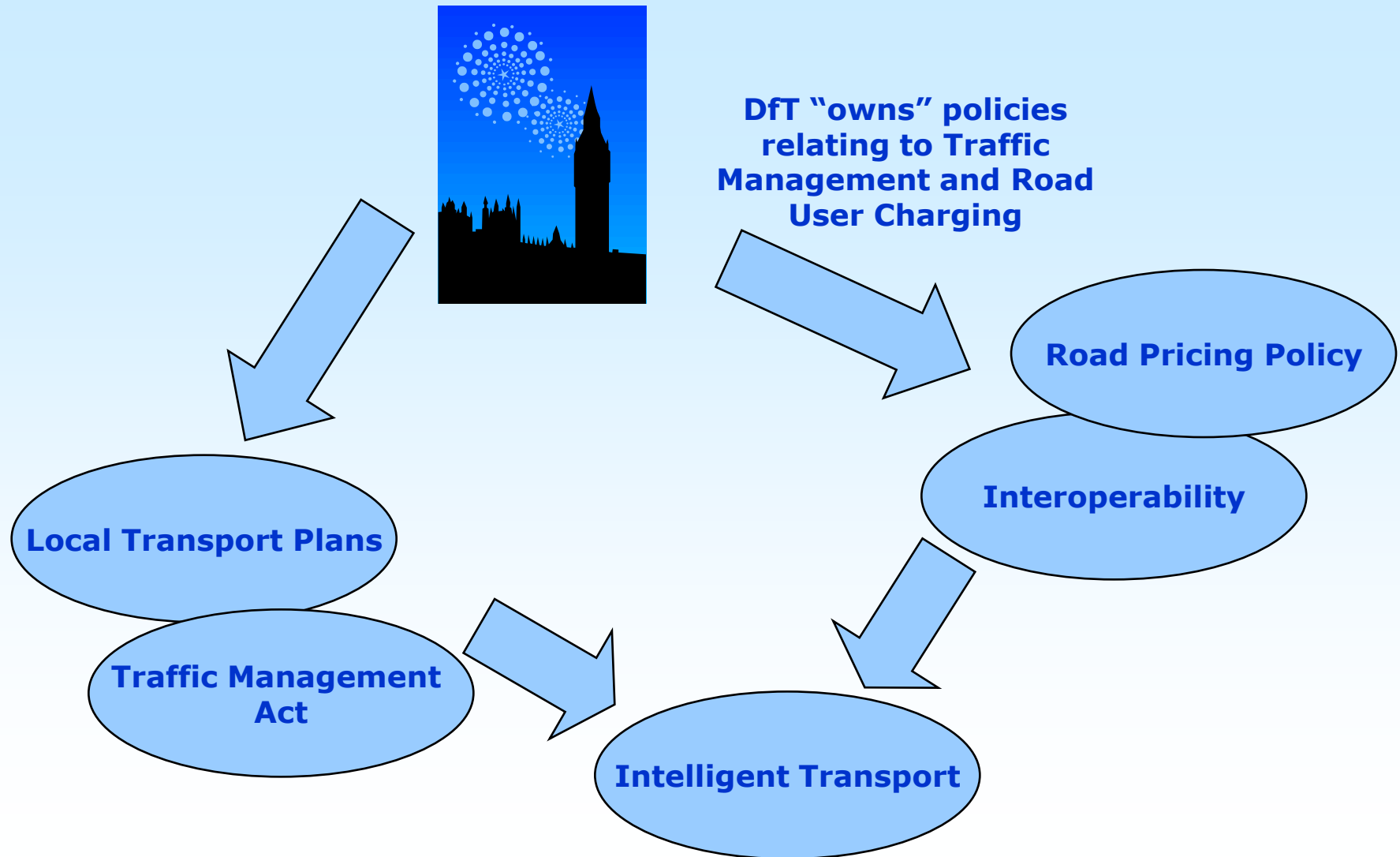
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# Overview

- **Policy context for UTMC and RUC**
- **Links between UTMC and RUC**
- **Potential benefits of integrating UTMC and RUC**
- **Challenges**
- **Conclusions**

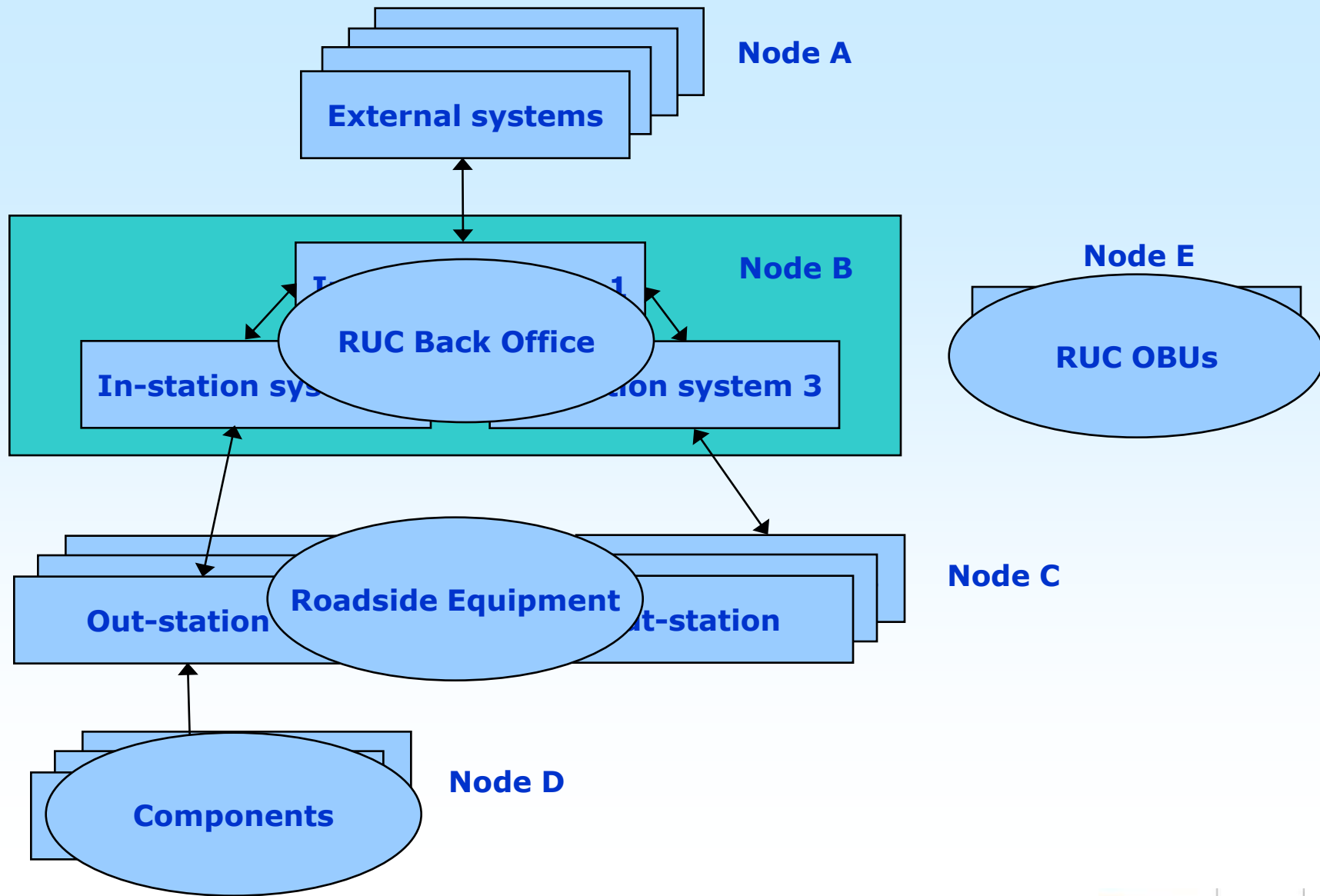
# Policy context for UTMC and RUC



# Links between UTMC and RUC

- **Both deal with Congestion**
- **Both aspects of traffic management**
- **Both need to be included in Local Transport Plans**
- **Both require:-**
  - ◆ In-stations (Back office)
  - ◆ Out-stations (Roadside equipment)
  - ◆ UTMC controlled units/detectors (Components)
- **Both require communications**
- **Both require secure distribution of data**
- **Both owned by the Local Highway Authority**

# Logical reference model for UTMC



# Some potential benefits of integrating UTMC and RUC

1. **Common communications**
2. **Common control centre**
3. **Making use of RUC information**
4. **Paying for services**
5. **Extending the possibilities for RUC**
6. **Use of traffic information**
7. **Customised traffic management**

# Benefits - Common communications

- **UTMC provides a common communications framework for all traffic management systems in the UTMC area**
- **RUC requires a high quality communications network**
- **Communications required:-**
  - ◆ Fixed high bandwidth network serving roadside infrastructure
  - ◆ Dedicated short-range communications (DSRC)
  - ◆ Cellular communications being considered
- **Could also be some sharing of equipment**
  - ◆ Video cameras
  - ◆ ANPR cameras

# Benefits - Common control centre

- **Urban Traffic Management Centres available**
- **Good candidates for RUC control centres**
- **Enables Highway Authority to monitor congestion**
- **Enables integration of traffic management measures with RUC**
- **May provide for efficient deployment of staff across several related areas, e.g.**
  - ◆ Traffic Management
  - ◆ Road User Charging
  - ◆ Public Transport Management

# Benefits - Making use of RUC information

- **RUC systems detect vehicles**
- **RUC systems classify vehicles**
- **RUC systems capture evidence of violators**
- **RUC systems could provide local Highway Authorities with data, such as:-**
  - ◆ Vehicle counts by time of day and day of week
  - ◆ Vehicle counts by type of vehicles
  - ◆ Patterns of use
    - ◆ Frequency of use by time of day and type of vehicle
  - ◆ Automatic Vehicle Identification
  - ◆ Evidence capture

# Benefits - Paying for services

- **On-board units for RUC carry a payment means**
  - ◆ May be monolithic OBU
  - ◆ May have a separate smartcard related to the same payment means
- **This payment means might be used to pay for other services, such as:**
  - ◆ Traffic information
  - ◆ Car parking
  - ◆ Park and ride
  - ◆ Public Transport
- **Enables some “intelligent” pricing policies to be supported, e.g.**
  - ◆ Incentives for car users to use public transport

# Benefits - Benefits - Extending the possibilities for RUC

- **RUC currently seen as a single charging application**
- **Links to UTMC could extend the possibilities**
  - ◆ Access control (to operate bollards automatically)
  - ◆ Disabled parking (to release reserved parking bays)
  - ◆ Booking of parking spaces in advance (released on arrival)
  - ◆ Access to park and ride car park and purchase of ticket

# Benefits - Use of traffic information

- **RUC users have on-board equipment**

- ◆ They also have a payment means

- **Highway Authorities could provide additional information for display within the vehicle:-**

- ◆ Traffic signing
- ◆ Traffic information
- ◆ Speed limits
- ◆ Car parking

- **May need an additional user display**

- **This could enhance the perception of a RUC proposal**

# Benefits - Customised traffic management

- **Imagine that all users are equipped with an OBU**
- **Traffic management could become more customised to specific users**
- **(Analogy: supermarkets offer customers special deals based on the knowledge of purchases gained from the use of loyalty cards)**
- **Examples might be:**
  - ◆ Discounts for frequent use of park and ride
  - ◆ Special offers on public transport
  - ◆ Special offers on off-peak car parking
  - ◆ Use of special lanes for residents
- **Other applications**
  - ◆ Intelligent Speed Adaptation
  - ◆ Electronic Vehicle Identification

# Challenges

1. **Scope of Road User Charging**
2. **Architecture for UK Congestion charging**
3. **Different requirements for RUC and UTMC**
4. **Business case for RUC**
5. **International influences**
6. **On-board equipment for charging**

# Challenges - Scope of Road User Charging

## ■ RUC in not just Urban Congestion Charging

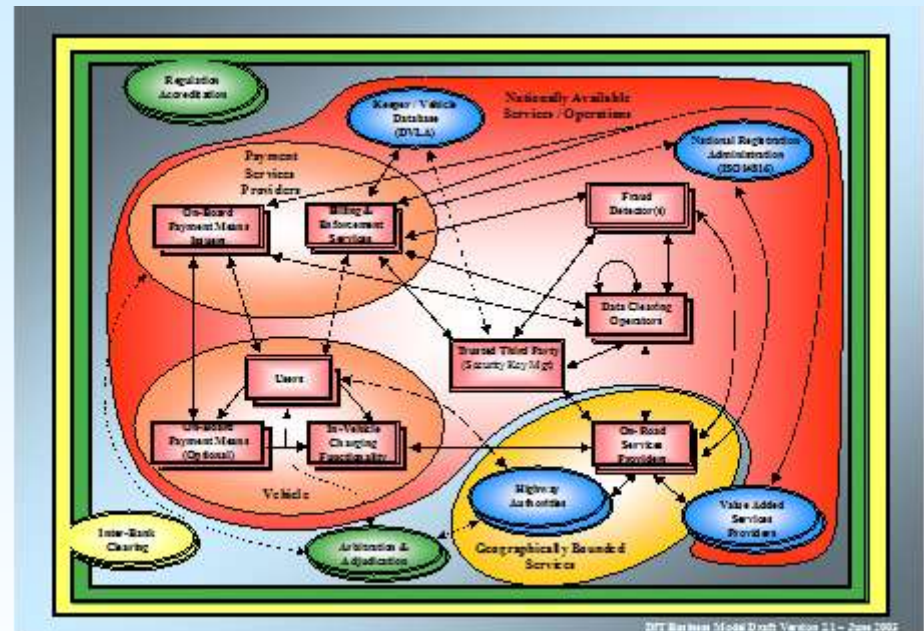
- ◆ Tolls
- ◆ Lorry Road-User Charge
- ◆ Regional, or even national charging scheme for all vehicles

## ■ Other stakeholders than Highway Authorities

- ◆ Toll/Charge Operators
- ◆ Banks and transport service providers (fuelcards)
- ◆ Member States

# Challenges - Architecture for UK Congestion charging

- **DfT business model for Urban Congestion Charging**
- **Strong focus on privacy**
- **National framework**
- **Other service providers**
  - ◆ Payment services
  - ◆ Clearing services
  - ◆ Security services



# Challenges - Different requirements for RUC and UTMC

## ■ UTMC involves

- ◆ “plug and play” equipment
- ◆ Many devices and suppliers
- ◆ Evolution of systems and equipment over time
- ◆ Many different applications working together

## ■ RUC involves

- ◆ Collection of revenues
- ◆ Integrated solution from a single source
- ◆ Provision of operation and maintenance service
- ◆ Single application
- ◆ Strong security framework

## ■ **These are not necessarily compatible!**

# Challenges - Business case for RUC

- **There is a strong business case for RUC**
  - ◆ Revenues collected directly
  - ◆ Operational cost to be minimised
- **UTMC has no revenue stream**
  - ◆ Based on social benefit
  - ◆ Operating costs are a real issue
- **No real incentive to “complicate” RUC system by integrating with UTMC**
  - ◆ Operating costs of UTMC and RUC may be difficult to separate

# Challenges - International influences

- **UTMC is a UK initiative**

- **RUC is international**

- ◆ Toll Operators and Member States drive the technical solutions
- ◆ Directive 2004/52/EC requires all charging systems across Europe to be interoperable
- ◆ OBUs for interoperable charging are envisaged

- **These developments will not include UTMC**

# Challenges - On-board equipment for charging

- **Most current OBUs are based on microwave transponders**
  - ◆ CEN TC278 5.8 GHz standards
- **Some new systems are using satellite positioning and cellular communications**
  - ◆ Germany
  - ◆ New generation Swiss OBU
  - ◆ UK
- **These systems will operate nationally and even internationally**
- **Governments are focussing interest on such systems**
- **The link with UTMC is less relevant for systems which do not have roadside infrastructure**
- **HOWEVER, traffic information services to these OBUs will be important**

# Conclusions

- **Some key benefits**
- **Also some very significant challenges**
- **No obvious way forward**
- **One way might be to draw these and other ITS applications together through the development of a UK ITS systems architecture**

# Towards a common system architecture for the UK

