

ISO/TR 17427-3:2015-11 (E)

Intelligent transport systems - Cooperative ITS - Part 3: Concept of operations (ConOps) for 'core' systems

| Contents | | Page |
|--------------------|---|-------------|
| Foreword | | vi |
| Introduction | | viii |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms and definitions | 1 |
| 4 | Abbreviated terms | 4 |
| 5 | Using this Technical Report | 5 |
| 6 | Overview of the role of a 'Core System' in C-ITS | 5 |
| 6.1 | What is a Concept of operations? | 5 |
| 6.2 | What are the core functions? | 6 |
| 6.3 | Functional subsystems | 6 |
| 6.4 | Institutional context | 7 |
| 6.5 | Specific service features characterizing C-ITS service provision | 8 |
| 6.6 | C-ITS and communication technologies | 10 |
| 6.6.1 | General | 10 |
| 6.6.2 | VANETs, MANETs and 'latency' | 10 |
| 6.6.3 | Hybrid communications | 13 |
| 6.6.4 | Short and medium range communication | 15 |
| 6.6.5 | Long range communication | 16 |
| 6.6.6 | Wide area broadcast | 16 |
| 6.6.7 | Positioning services | 16 |
| 6.6.8 | Digital road map data | 17 |
| 6.7 | Actors involved in C-ITS service provision | 17 |
| 6.8 | C-ITS enabling data | 20 |
| 6.9 | Cooperative ITS applications and services | 22 |
| 6.9.1 | System of systems | 23 |
| 6.10 | C-ITS Privacy and anonymity | 23 |
| 6.10.1 | Privacy overview | 23 |
| 6.10.2 | Data messages and privacy | 24 |
| 6.10.3 | Security | 25 |
| 6.10.4 | Data management (including capture, storage and access) | 25 |
| 7 | 'Core' systems | 26 |
| 7.1 | Core system overview | 26 |
| 7.1.1 | General | 26 |
| 7.1.2 | Single core systems | 27 |
| 7.1.3 | Multiple core systems | 27 |
| 7.1.4 | Other 'Central' systems | 27 |
| 7.1.5 | Facilitate a platform for sharing of information and efficient use of resources | 28 |
| 7.2 | Justification for 'Core Systems' | 28 |
| 7.2.1 | Vision, drivers and objectives | 28 |
| 7.2.2 | Key strategic objectives for the deployment of core system support | 29 |
| 7.2.3 | Key technical objectives for the deployment of core system support | 29 |
| 7.2.4 | Principal elements of a core system | 30 |

| | | |
|--------|---|----|
| 7.2.5 | Proposed features of C-ITS core systems | 31 |
| 7.2.6 | Main mission of the `Core System' | 35 |
| 7.2.7 | Scope of `Core System' services | 36 |
| 7.2.8 | Exclusions from CorSys | 36 |
| 7.2.9 | Probe data storage | 36 |
| 7.2.10 | Roadside equipment (RSE) | 37 |
| 7.2.11 | External support systems (ESS) | 37 |
| 7.2.12 | Communications options | 37 |
| 7.2.13 | Authority/jurisdiction databases | 38 |
| 7.2.14 | Core system stakeholders | 39 |
| 7.2.15 | Core system communications | 39 |
| 7.2.16 | Applications | 42 |
| 7.2.17 | Core system interactions | 42 |
| 7.2.18 | Core system operational goals | 43 |
| 7.3 | `Core system' overview of requirements | 44 |
| 7.3.1 | Definition of a requirement | 44 |
| 7.3.2 | `Core System' requirements identification process | 44 |
| 7.3.3 | Functional components | 49 |
| 7.4 | Background, objectives and scope of a `Core System' | 50 |
| 7.5 | Operational policies and constraints | 51 |
| 7.5.1 | Certification | 51 |
| 7.5.2 | Operations and maintenance | 52 |
| 7.5.3 | Security management | 52 |
| 7.5.4 | Data provision/ownership | 52 |
| 7.5.5 | System performance management | 52 |
| 7.5.6 | Flexibility | 53 |
| 7.5.7 | Core system characteristics and environment | 53 |
| 7.5.8 | Deployment configurations | 54 |
| 7.5.9 | Deployment footprint | 54 |
| 7.5.10 | Subsystems | 57 |
| 7.5.11 | Subsystem descriptions | 57 |
| 7.6 | Modes of operation | 62 |
| 7.7 | User types and other involved personnel | 64 |
| 7.8 | Operational scenarios | 65 |
| 7.9 | Vehicle-originated broadcast | 66 |
| 7.10 | Infrastructure-vehicle-unicast | 69 |
| 7.11 | Support environment | 71 |
| 7.11.1 | Subsystems | 72 |
| 7.11.2 | Personnel | 72 |
| 7.11.3 | Processes | 72 |
| 7.12 | Disadvantages and limitations | 72 |
| 8 | Example use cases | 73 |
| 8.1 | General | 73 |
| 8.2 | Example Use Case (1): User data exchange | 74 |
| 8.3 | Example Use Case (2): Certificate distribution | 75 |
| 8.4 | Example Use Case (3): Certificate revocation list distribution | 75 |
| 8.5 | Example Use Case (4): Misbehaviour action: Certificate revocation list addition | 76 |
| 8.6 | Example Use Case (5): Data subscription | 77 |
| 8.7 | Example Use Case (6): Remote services | 78 |
| 8.8 | Example Use Case (7): Core service status distribution | 79 |
| 8.9 | Example Use Case (8): `Core System' operations | 80 |
| 8.10 | Example Use Case (9): System expansion | 80 |
| 8.11 | Example Use Case (10): Core discovery | 81 |
| 8.12 | Example Use Case (11): Service data backup | 82 |
| 8.13 | Example Use Case (12): Service takeover | 82 |
| 9 | Summary of impacts | 83 |
| 9.1 | Operational impacts | 83 |
| 9.1.1 | Policy | 83 |
| 9.1.2 | System management | 84 |

| | | |
|-------|---|----|
| 9.1.3 | System operation | 85 |
| 9.1.4 | Service receipt | 85 |
| 9.2 | Organizational impacts | 87 |
| 9.2.1 | Policy | 87 |
| 9.2.2 | System management | 88 |
| 9.2.3 | System operation | 89 |
| 9.3 | Impacts during the deployment phases | 89 |
| 9.3.1 | System management | 90 |
| 9.4 | Measuring the impacts | 90 |
| 10 | Cooperative vehicle and highway systems policy and institutional issues | 91 |
| 11 | Funding and governance | 91 |
| | Bibliography | 94 |