

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

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

---

<b>Contents</b>		<b>Page</b>
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