

Contents

	Page
Foreword	4
Introduction	6
1 Scope	8
2 Normative references	8
3 Terms and definitions.....	8
4 Context, Requirements and Foundation	10
4.1 Digitalization as Driving Force of Urban Mobility	10
4.2 Holistic Traffic and Mobility Insight.....	11
4.3 Eco-System of Urban Mobility Data for Real-Time Applications.....	14
4.4 The SUMP as Underlying Concept	16
4.5 Defining the Stakeholder Group.....	17
4.6 Impact of connected autonomous vehicles.....	18
4.7 Open data.....	19
4.8 KPI Circularity.....	19
5 Use Cases.....	20
5.1 General Information.....	20
5.2 Public Transport.....	21
5.2.1 Mobility stuaerts for public transport.....	21
5.2.2 On-demand shuttle buses for regional and long distance.....	22
5.2.3 Managing transport disruptions across the network with MaaS.....	23
5.3 Walking and cycling.....	24
5.4 Intermodal transport.....	24
5.4.1 Platform-based seamless transportation.....	24
5.4.2 Influence of major events on traffic	25
5.5 Urban road safety.....	26
5.5.1 Data-driven approaches for safe and clean urban roads	26
5.5.2 Connected autonomous driving.....	27
5.6 Road transport (flowing and stationary)	29
5.6.1 Optimizing traffic through real-time data.....	29
5.6.2 Smart Parking.....	31
5.6.3 Alternate Routing.....	31
5.7 Urban logistics.....	33
5.7.1 Logistic Hubs.....	33
5.7.2 Urban Air Mobility	34
5.8 Mobility management.....	36
5.8.1 Mobility Hubs	36
5.8.2 Charging at my office.....	37
5.8.3 Multi-modal transportation led by employer	37
5.9 Intelligent Transport Systems.....	38
5.9.1 City-wide Environmental Sensing.....	38
5.9.2 Trend Analysis as input for ITS.....	38
5.10 Supra-regional mobility	39
5.11 Social Media	40
6 Roles and Responsibilities	41

7	Organisation and Operator model.....	42
7.1	Business models & licences models	42
7.2	Data sovereignty & governance.....	45
7.3	Urban infrastructures.....	47
8	Technical Architecture/ Infrastructure	48
8.1	General Observation and Relationships with Existing Work.....	48
8.2	Reference Architecture	48
8.3	Sample Solution: Real-Time Traffic Light Assistant.....	52
8.4	Sample Solution: Intermodal Journey	53
8.5	Sample Solution: Urban Air Mobility.....	54
8.6	Sample Solution: Platform for Walking and Cycling	55
8.7	Sample Solution: Smart Parking.....	57
8.8	Sample Solution: 3D model of the city, real-time communication with special size vehicles	58
	Bibliography	59

Figures

Figure 1	— The overall Eco-System of Urban Mobility Data for Real-Time Applications.....	15
Figure 2	— Schematic process of SUMP	16
Figure 3	— Overview of stakeholders that produce, use and are in need of real time urban mobility data.....	18
Figure 4	— Evolution autonomous driving.....	19
Figure 5	— Example platform business case smart parking & public transport.....	43
Figure 6	— Pricing models and data-driven business models	44
Figure 7	— Schematic picture of an Open Urban Platform, modified from DIN SPEC 91357	50
Figure 8	— EIP SCC (European Innovation Partnership on Smart Cities and Communities) Urban Platform Capability Map, from DIN SPEC 91357	52

Tables

Table 1	— Roles and Responsibilities	41
Table 2	— Real-Time Traffic Light Assistant.....	53
Table 3	— Intermodal Journey	54
Table 4	— Urban Air Mobility	55
Table 5	— Walking and Cycling.....	56
Table 6	— Onstreet-parking scenario and data flow.....	57