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| Version: 0.3 |
| Author: TC ITS - EC/EFTA – Date:25 Sep 2018 |
| Last updated by: ETSI Secretariat– Date: 04 Oct2018 |
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Terms of Reference - Specialist Task Force

STF CU (TC ITS / WG1)

**Specifications for the definition of the cooperative ITS Vulnerable Road Users (VRU) service**

Summary information

|  |  |
| --- | --- |
| Funding | **EC/EFTA. Specific agreement N°ETSI/2017-07.**  Total budget 162 049,03 € EUR   * Manpower budget: 155 400,00 € * Travel budget: 6 649,03 € |
| Time scale | Start date: December 2018  End date: 30 June 2020 |
| Work Items | DTR/ ITS-103300-1: Intelligent Transport System (ITS); Vulnerable Road Users (VRU) awareness; Part 1: Use Cases definition  DTS/ ITS-103300-2: Intelligent Transport System (ITS); Vulnerable Road Users (VRU) awareness; Part 2: Functional Architecture and Requirements definition  DTS/ ITS-103300-3: Intelligent Transport System (ITS); Vulnerable Road Users (VRU) awareness; Part 3: Specification of VRU awareness basic service |

**Part I – Policy relevance and expected market impact**

# Policy relevance

Intelligent Transport Systems (ITS) services and applications can create clear benefits in terms of transport efficiency, sustainability, accessibility, safety and security, while contributing to the EU’s single market and competitiveness objectives. The proposed action is in response to ITS Actions 3 and 21 of the 2018 Rolling Plan for ICT Standardisation:

ACTION 3: “Taking into account the C-ITS architecture, ICT related standards for applications to support vulnerable road users (VRU, e.g. projects like VRUITS www.vruits.eu). In particular, SDOs should agree on common requirements and relevant communication standards should be identified by ETSI TC ITS”.

ACTION 21: “To continue international cooperation in the field of ITS standardisation, in particular with the USA and Japan, but also with other regions, including participation of the relevant SSOs)”.

The proposed action is also aligned with the ITS Directive (2010/40/EU) concerning priority area 4 (V2I and I2V communication) as well as the European C-ITS Strategy adopted in 2016.

# Rationale

In recent years both technological developments and research activities in the fields of Intelligent Transport Systems (ITS) have primarily focussed on motorised transport to improve safety and eco-logical (environmental) impacts by advancing equipment of vehicles and infrastructure. Vehicle-to-Vehicle (V2V) safety systems using Dedicated Short Range Communications (DSRC) have been researched and have been undergoing standardization for quite a long time while deployments will start very soon. The uptake of ITS applications has assisted in the decrease of road traffic fatalities, particularly amongst passenger car occupants. However, Vulnerable Road Users (VRUs), such as pedestrians, cyclists and motorcyclists have not enjoyed the same decrease in fatalities. Together, they account for 68% of the fatalities in urban areas (CARE, 2009). Motorcyclists account for 16% of fatalities, which is much higher than their contribution to traffic (CARE 2009). It is therefore clear that, in the context of ITS cooperative systems, VRUs have to be taken into account and therefore interoperability between vehicle-based and portable safety devices is of paramount importance for improving the overall safety and to decrease the fatalities in both urban and non-urban areas. There is therefore the need to develop VRU related specifications in order to allow the deployment of VRU safety applications.

ETSI received and accepted two ITS-related “mandates”: M/453 in 2009 related to C-ITS and standardisation request M/546 on urban ITS in 2016. This proposed action is in response to both since VRUs are part of “cooperative systems” (M/453) and are a key element for the future deployment of cooperative systems in urban areas (M/546). Due to the amount of work to be performed and to the fact that VRUs are an important element in C-ITS, this requires financial support in order to make sure the related standards are available in due time.

# Objective

The objective of this action is to produce a consistent set of specifications related to Vulnerable Road Users (VRU) in alignment with non-European developments on the same topic (for instance in the US) in response to M/453 (C-ITS systems) and M/546 (Urban ITS) and in accordance with ITS Actions 3 and 21 of the 2018 Rolling Plan for ICT Standardisation.

Based on Regulation (EU) No 168/2013 of 15 January 2013 on the approval and market surveillance of two- or three-wheel vehicles and quadricycles, the following types of road users are considered as VRUs: pedestrians (including children, elderly people, people with special needs and joggers); emergency responders, safety workers, road workers; wheelchair users and prams; skateboards and segways; cyclists, e-cyclists and motorcyclists.

# Market impact

When designing an ITS system, all relevant users should be taken into account, especially the requirements of elderly users and users with special needs which means that the integration of VRUs into the ITS system needs to be done from the very beginning. During the coming years, the first C-ITS devices for VRUs are expected to come on the market.

These will be integrated in vehicles (e.g. motorcycles) and will target special user groups (e.g. road workers). The first generation of devices is not expected to have sufficient location accuracy to perform accurate risk assessment, but only to be used for awareness of other road users. As sensor accuracy and power management improves, more accurate devices and applications will come to the market, allowing the performance of accurate risk management and informing both car drivers and VRUs of oncoming collisions.

However, without proper standards in place (standards that need to cover communication technologies and interfaces between VRUs, other road users and infrastructure), there is the risk that a plethora of non-standardised proprietary solutions will appear on the market with obvious consequences in terms of interoperability which is essential for a cooperative system and in particular for the safety of VRUs. In addition, there might be integration problems and consequently the risk of reinvestment in the related deployed infrastructure (for instance intelligent pedestrian traffic signals) at a later stage in order to upgrade or re-engineer the deployed solutions to the required standards with obvious consequences in terms of costs.

**Part II – Execution of the work**

# Working method / approach

## Specialist Task Force (STF)

ETSI will perform this work by the creation of an ETSI STF, reporting the milestones and the draft deliverables to ETSI TC ITS, according to the planned meeting agenda and additional dates agreed by the TC ITS Chairman. TC ITS WG1 (Application Requirements and Services) will perform an active role in steering and contributing to this work.

Coordination with various stakeholders will be necessary, under TC ITS supervision, to achieve the best outcome of this work and the widest possible collection of views amongst all parties concerned. In particular, the STF will liaise with SAE and those other players involved in the VRU domain so as to assure the development of a consistent set of specifications. In addition, it is expected to interact also with relevant H2020 ongoing projects (such as PROSPECT, XCYCLE, SafetyCube and SENIORS) and with the C-ITS platform experts group.

## Other types of activity than STFs

The draft deliverables (stable drafts and final drafts for approval) will be distributed for comments not only to relevant ETSI members via mailing lists, but also to relevant ETSI partners (such as SAE) and to the ITS CG so as to collect inputs from as wide an ITS community as possible.

## Expertise required, (qualification required, mix of skills)

The STF work will be performed by a group of Companies/Organizations (up to **four** Service Providers) that will collectively ensure the following mix of skills:

* Deep knowledge of Cooperative ITS (C-ITS)
* Good automotive background
* Good knowledge of C-ITS standards (ETSI, CEN, SAE, IEEE, etc.)
* Experience in drafting Standards
* Experience to work in an international environment
* Expertise on mobile communication applications and protocols as well as location and positioning technologies
* Experience in considering the human reactions and interactions in traffic conditions.

The STF Leader will be appointed from one of the Service Providers and will be responsible for co-ordinating the execution of the tasks assigned to the individual Service Providers, according to the requirements in the Terms of Reference (based on the action grant) and following the technical direction given by TC ITS.

The STF leader will also possess project management experience, report-writing skills, experience of consensus building, presentation skills, experience of working in an international environment, and in liaising with other international organisations.

The Service Providers will be organised to deliver on the following tasks (or group of tasks):

T1 STF Lead including liaison with relevant actors in the C-ITS/VRU domain as well as the production of the Interim Report (IR) and the Final Report (FR) to the EC/EFTA.

T2 Production of TR 103 300-1 containing all use cases related to VRU

T3 Production of the TS 103 300-2 addressing the requirements for a VRU awareness service as well as the related functional architecture

T4 Production of TS 103 300-3 addressing the definition of the VRU awareness basic service

## Previous work

ETSI has been involved in ITS standardisation for a number of years and has produced a number of European standards and technical specifications essential for the deployment of ITS cooperative systems in the European Community. TS 101 539-1, for instance, covers V2X/Road Hazard Signalling (RHS) requirement specification and will be taken into account in this action.

In addition to the ETSI work, SAE has produced a specification related to Vulnerable Road User Safety Message Minimum Performance Requirements which will be taken into account as well together with the outcome of relevant EC projects (already finalized or still ongoing) such as VRUITS (improving the safety and mobility of Vulnerable Road Users through ITS applications), PROSPECTS (Proactive Safety for Pedestrians and Cyclists), XCYCLE (Advanced measures to reduce cyclists' fatalities and increase comfort in the interaction with motorised vehicles), SafetyCube (Safety CaUsation, Benefits and Efficiency) and SENIORS (Safety ENhanced Innovations for Older Road userS).

The results from relevant projects will be collected during the first weeks of the STF. For already closed projects, they will be obtained by reading the public deliverables and/or scientific publications, and if not available, contacting the former partners. For ongoing projects, the coordinators will be contacted to seek the possibility of a liaison enabling documentation sharing.

# Performance indicators

Information that will act as performance indicators against the contracted activity will be provided by the STF in the following cases:

**Effectiveness and efficiency:**

Details will be provided, throughout the lifetime of the proposed action, on:

* the number of meetings held in relation to this work:
  + the number of participants;
  + the stakeholder communities represented;
  + the number of presentations and technical contributions made on the activity by the STF;
* an evaluation of feedback received identifying key points that needed to be considered by the STF and any recommended actions;
* project progress in relation to the schedule specified

**Proposed effectiveness and efficiency benchmarks**

1. Reports produced by the STF for ETSI TC ITS about the progress of the work. A report will be produced for each TC ITS meeting held during this activity (expected to be at least 4 reports a year).
2. Draft versions of the deliverables to be circulated to TC ITS WG1 and TC ITS for comments,
3. namely: stable draft and final draft for approval.
4. Draft versions of the deliverables to be circulated to ITS CG for comments, namely: stable draft and final draft for approval.
5. Draft versions of the deliverables to be circulated to SAE and other relevant partners for comments, namely: stable draft and final draft for approval
6. 90% of the tasks and other milestone-related schedule on time (less than 5 days after the planned dates)

**Stakeholder engagement and satisfaction:**

An analysis will be given of the balance of stakeholder representation in the activity and the number of liaison activities performed.

The STF, through TC ITS, will need to liaise with those stakeholders working in related areas such as SAE.

**Proposed Benchmarks**

1. Contributions received from other stakeholders to the work (at least 2 liaisons with stakeholders external to TC ITS, e.g. SAE)
2. Comments provided to the draft versions of the deliverables circulated by the STF (at least 12 comments provided to the draft versions from TC ITS and external stakeholders)

**Dissemination of results:**

Information will be provided on the effectiveness of activities related to the dissemination of project deliverables and efforts made to raise industry awareness of the activity.

**Proposed Benchmarks**

1. At least 1 presentation made to the ITS-CG
2. At least one news release (for example on the ETSI web site) on the work, detailing the achievement of important results and milestones.

# Work plan, milestones and deliverables

## Deliverables

As shown in Table 1, the action will produce two deliverables to be submitted to the EC/EFTA: an Interim Report (IR) and a Final Report (FR). The IR will be submitted 12 months after the signature of the action grant and will detail the work performed to achieve the production of the first two technical deliverables (D1 and D2) as well as the latest drafts of these two specifications.

The FR (provided at the end of the action i.e. not later than 21 months after the signature of the action grant) will provide an overall report of the activity performed along with 1 TR and 2 TS formally adopted for publication (D1 to D3), as well as details of the resource usage along with an analysis of the performance indicators.

**Table 1: List of Reports**

|  |  |
| --- | --- |
| **Deliv. ID** | **Title and Contents** |
| Interim Report (IR) | **Title**: Interim Report to the EC/EFTA  **Content**: This report to the EC/EFTA will include:  1. The activities performed, the coordination work of the STF activities and the production of the expected deliverables anticipated in the work-plan.  2. The latest drafts of the deliverables specified in Table 2 below.  3. Details of ad-hoc meetings (for instance with SAE) if necessary  4. The plan for the future activities to complete the deliverables and further expected coordination meetings. |
| Final Report (FR) | **Title**: Final Report to the EC/EFTA.  **Content**: This report will include:  1. The activities performed, the coordination work of the STF activities and the production of the expected deliverables.  2. The published deliverables specified in Table 2 below (D1 to D3)  3. Detailed report of the performance indicators outlined in clause 6 of this proposal.  4. Details of specific meetings (for instance with SAE) if necessary.  5. Report on the resources that have been used for performing the work |

The goal of this action is to define the use cases related to Vulnerable Road Users (VRU) in the context of C-ITS and specify the associated requirements, VRU system architecture and message format for a VRU awareness service as shown in Table 2. Section 7.2 gives more details on the work plan, milestones and due dates.

**Table 2: list of deliverables**

| **Deliv. ID** | **Standard number/version** | **Working title** | **Scope/Remarks** |
| --- | --- | --- | --- |
| D1 | TR 103 300-1 V1.1.1\* | Intelligent Transport System (ITS); Vulnerable Road Users (VRU) awareness; Part 1: Use Cases definition | Definition of the VRU system and use cases (stage 1) |
| D2 | TS 103 300-2 V1.1.1\* | Intelligent Transport System (ITS); Vulnerable Road Users (VRU) awareness; Part 2: Functional Architecture and Requirements definition | Definition of requirements related to VRUs (stage 2); Definition of the functional architecture of the VRU system (stage 3); Analysis of the impact on existing standards (for instance the CAM European Standard) will be performed as well and included in an informative annex. |
| D3 | TS 103 300-3 V1.1.1\* | Intelligent Transport System (ITS); Vulnerable Road Users (VRU) awareness; Part 3: Specification of VRU awareness basic service | Specification of communication protocols, message format, semantics and syntax as well as key interfaces and protocol operation for the VRU awareness service (stage 4) |

\* Version at publication time.

## Work plan:

Table 3 shows the detailed work plan for this action in terms of tasks. T0 is the date of signature of the contract.

**Table 3: Task Description with milestones**

| **Task** | **Description and methodology** | **Deliverables** |
| --- | --- | --- |
| **T1** | **STF Organization** |  |
| T1.1 | STF Setup  ETSI, the TC ITS chairman as well as the ITS WG1 chairman will interview the STF candidates and select those to best meet the work plan.  ETSI will make arrangements for STF members (service contracts, etc.). |  |
| T1.2 | STF Leader  The STF leader will:   * Plan the work of the STF members, ensuring that the timescales of the STF deliverables are met * Organise STF meetings to discuss the drafts, recording any major issues and resolutions of the STF, identifying and progressing the actions of STF members * Report to TC ITS and TC ITS WG1 on the work of the STF * Represent, or arrange for other STF members to represent the STF at other external meetings as appropriate (e.g. ITS-CG) * Provide drafts of the IR and FR to the ETSI secretariat   **Expertise required:**   * Ability to lead and manage a team * Project management and communication skills   7 travels to present results to TC ITS meetings and ITS CG are foreseen  **Effort Required: 25 units**  Milestones:  **Start:** T0+2  **M1.1** Interim report: T0+12  **M1.2** Final report: T0+21 |  |
| T1.3 | **Interactions with other relevant organizations**  One of the goals of this task is to ensure that the STF fluently interacts with relevant actors in the C-ITS/VRU field in order to make sure the work is well coordinated and synchronised. The organisation of relevance for this action is SAE that has already produced a specification related to VRU (J2945 - Vulnerable Road User Safety Message Minimum Performance Requirements). This interaction is therefore indispensable for ensuring that the standards produced do not diverge from SAE material so as to produce in due time a consistent set of standards which is globally applicable.  In addition, a further interaction with relevant ongoing H2020 projects (such as PROSPECT, XCYCLE, SafetyCube and SENIORS), VRU associations and with the C-ITS platform experts group might also be needed, as described in section 5.4.  The STF, under TC ITS supervision, will collaborate with SAE using the basic Cooperation agreement ETSI has with SAE.  **Effort Required: 13 units** |  |
| **T2** | **Definition of the VRU use cases (TR 103 300-1)** |  |
| T2.1 | **Description:** The goal of this task is to produce the deliverable TR 103 300-1: “Intelligent Transport System (ITS); Vulnerable Road Users (VRU) awareness; Part 1: Use cases definition”. This deliverable will specify the use cases related to Vulnerable Road Users such as such as pedestrians, bicyclists and road workers. Each use case will be described in detail and an associated flow chart will show the interaction between the involved actors. | TR 103 300-1 |
| T2.1a | Methodology: The definition of the VRU use cases will take into account all the work already done in other standards and specifications such as ETSI TS 101 539-1 (V2X Applications; Part 1: Road Hazard Signalling (RHS) application requirements specification and SAE J2945 (Vulnerable Road User Safety Message Minimum Performance Requirements). In addition, the outcome of relevant past or ongoing H2020 projects will be scrutinized, as described in section 5.4.  The methodology for the development of the Technical Report will be the following:   * Analysis of the existing material and specifications related to Vulnerable Road Users * Categorization of VRUs * Definition of VRU system components * Categorization of use cases * Definition of use cases   Since the use cases definition is preliminary to the requirement specifications, the STF is expected to produce a stable draft 7 months after the start of the STF.  **Working sessions:**  It is anticipated that the majority of the work will be performed as drafting work remotely and electronically. However, a few additional face-to-face working sessions will be needed - especially for clarification purposes with regard to terms and definitions and the alignment of the various information sources. It is planned to have 3-4 face-to-face working sessions in total (tasks 2 to 4).  **Effort required: 50 units**  **Intermediate and final Milestones:**  **Start:** T0 + 2.  **M2.1:** Stable draft: T0 + 7.  **M2.2:** Final draft approved by TC ITS: T0 + 9.  **M2.3**: TR published: T0+10. | TR 103 300-1 |
| **T3** | **Definition of VRUs functional requirements and architecture (TS 103 300-2)** |  |
| T3.1 | **Description:** The goal of this task is to produce the deliverable TS 103 300-2: “Intelligent Transport System (ITS); Vulnerable Road Users (VRU) awareness; Part 2: Functional Architecture and Requirements definition”. This deliverable will define the requirements springing from the identified use cases as well as the functional architecture of the VRU system. Starting from the identified VRU use cases (Task T2), a consistent set of VRUs requirements will be identified. These requirements will be the baseline for the definition of the functional architecture. The impacts on existing ITS standards and protocols (for instance the communication architecture defined in EN 302 665 and the ITS services such as Cooperative Awareness Basic Service defined in EN 302 637-2) will be investigated as well. A liaison with SAE as well as ETSI TC MSG and/or other relevant ETSI Technical Committees might be needed. | TS 103 300-2 |
| T3.1a | **Methodology**: The definition of the VRU-related requirements will be based on the use cases defined in Task 2 and will take into account all the work already done in other standards and specifications such as SAE J2945 (Vulnerable Road User Safety Message Minimum Performance Requirements). In addition, the outcome of relevant past or ongoing H2020 projects will be scrutinized.  The methodology for the development of the Technical Specification will be the following:   * Analysis of the existing material and specifications related to Vulnerable Road Users, including the C-ITS platform for VRU services * Analysis of the VRU use cases identified in Task T2 * Categorization and definition of VRUs requirements: system requirements, operational requirements, communication requirements, security requirements, etc. * Definition of VRU functional architecture * Identification of the impacts on existing ITS standards and protocols   The STF is expected to produce a stable draft 7 months after the start of the task for this STF (T0+6).  **Working sessions:**  It is anticipated that the majority of the work will be performed as drafting work remotely and electronically. However, a few additional face-to-face working sessions will be needed - especially for clarification purposes with regard to terms and definitions and the alignment of the various information sources. It is planned to have 3-4 face-to-face working sessions in total (tasks 2 to 4).  **Effort required: 65 units**  **Intermediate and final Milestones:**  **Start:** T0 + 6  **M3.1:** Stable draft: T0 + 13.  **M3.2:** Final draft approved by TC ITS: T0 + 15.  **M3.3:** TS published: T0+16. | TS 103 300-2 |
| **T4** | **Specification of the VRU awareness service (TS 103 300-3)** |  |
|  | **Description**: The goal of this task is to produce the deliverable TS 103 300-3: “Intelligent Transport System (ITS); Vulnerable Road Users (VRU) awareness; Part 3: Specification of VRU Awareness Service”.  This deliverable will specify the communication protocols, message format, semantics and syntax as well as key interfaces for the VRU awareness service. The following will be part of the deliverable:   * VRU service functional description * VRU awareness message dissemination * VRU awareness message format specification in ASN.1 * VRU service protocol operation | TS 103 300-3 |
|  | **Methodology**: The definition of the VRU service will be based on the functional VRU architecture defined in Task 3 and will take into account all the work already done in other standards and specifications such as SAE J2945 (Vulnerable Road User Safety Message Minimum Performance Requirements). In addition, the outcome of relevant past or ongoing H2020 projects will be scrutinized, as described in section 5.4.  The methodology for the development of this deliverable will be the following:   * Analysis of the outcome of T2 and T3 tasks * Definition of interfaces in the context of ITS architecture * Specification of the message * Specification of the protocol operation   The STF is expected to produce a stable draft 18 months after the start of the STF.  **Working sessions:**  It is anticipated that the majority of the work will be performed as drafting work remotely and electronically. However, a few additional face-to-face working sessions will be needed - especially for clarification purposes with regard to terms and definitions and the alignment of the various information sources. It is planned to have 3-4 face-to-face working sessions in total (tasks 2 to 4).  **Effort required: 100 units**  **Intermediate and final Milestones:**  **Start:** T0+12  **M4.1:** Stable draft: T0 + 18.  **M4.2:** Final draft approved by TC ITS: T0 + 20.  **M4.3:** TS published: T0+21. | TS 103 300-3 |

Table 4 shows the overall required effort in Units.

**Table 4: summary of effort required**

| **Task** | **Output** | **Required Efforts (Units)** |
| --- | --- | --- |
| **T1** | IR, FR | **38** |
| **T2** | TR 100 103-1 | **50** |
| **T3** | TS 100 103-2 | **65** |
| **T4** | TS 100 103-3 | **100** |
| **TOTAL** | | **253** |

Table 5 shows the calendar of tasks with the milestones.

It is planned to start working on Task 3 at T0+6 and on Task 4 at T0+12

**Table 5: Calendar of tasks with milestones (T1 to T4)**

|  |  |  |  |
| --- | --- | --- | --- |
| **N** | **Task / Milestone / Deliverable** | Target date | Estimated Costs |
|  | Start of work | Dec-2018 |  |
| T1 | STF Leadership & Interactions with other organisations | From Dec-2018  to Jun-2020 | 23 400 |
| T2 | Definition of the VRU use cases (TR 103 300-1) | From Dec-2018  to Aug-2019 | 30 000 |
| T3 | Definition of VRUs functional requirements and architecture (TS 103 300-2) | From Apr-2019 to Feb-2020 | 40 000 |
| T4 | Specification of the VRU awareness service (TS 103 300-3) | From Oct-2019 to Jun-2020 | 62 000 |
| M1.1 | Interim Report approved by ETSI Secretariat | Oct-2019 |  |
| M1.2 | Final report approved by ETSI Secretariat | Jun-2020 |  |
| M2.1 | Stable draft of TR 103 300-1 available  Report to ITS WG1 | May-2019 |  |
| M2.2 | Final draft of TR 103 300-1  Progress report to be approved by TC ITS | Jul-2019 |  |
| M2.3 | TR 103 300-1 published | Aug-2019 |  |
| M3.1 | Stable draft of TS 103 300-2 available  Report to ITS WG1 | Nov-2019 |  |
| M3.2 | Final draft of TS 103 300-2  Progress report to be approved by TC ITS | Jan-2020 |  |
| M3.3 | TS 103 300-2 published | Feb-2020 |  |
| M4.1 | Stable draft of TS 103 300-3 available  Report to ITS WG1 | Apr-2020 |  |
| M4.2 | Final draft of TS 103 300-3  Progress report to be approved by TC ITS | May-2020 |  |
| M4.3 | TS 103 300-3 published | Jun-2020 |  |
| **Total** | | | **155 400** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Month** | | | | | | | | | | | | | | | | | | | | |
| **Task** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| Establish STF team |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T1. Organization |  |  |  |  |  |  |  |  |  |  |  | **M 1.1** |  |  |  |  |  |  |  |  | **M1.2** |
| T2. VRU use cases |  |  | **Start** |  |  |  | **M2.1** |  | **M2.2** | **M2.3** |  |  |  |  |  |  |  |  |  |  |  |
| T3. VRU functional requirements and architecture |  |  |  |  |  | **Start** |  |  |  |  |  |  | **M 3.1** |  | **M3.2** | **M3.3** |  |  |  |  |  |
| T4. Specification of VRU service |  |  |  |  |  |  |  |  |  |  |  | **Start** |  |  |  |  |  | **M 4.1** |  | **M4.2** | **M4.3** |

**Part III: Financial part**

# Financial provisions in the EC/EFTA contract

## Total action costs

The total action costs will amount to 253 units x 640,51 €: 162 049,03 € (lump sum)

* Manpower budget: 154 400,00 €
* Travel budget: 6 649,03 €

## Indirect costs

There are no indirect costs involved.

## Direct (eligible) costs

The direct costs will amount to: 162 049,03 € **= lump sum** based on an EC contribution of 95%

(153 946,58 €) and co-financed by 5% from EFTA (8 102,45 €).

## Travelling costs

|  |  |
| --- | --- |
| **Expected travels** | **Cost estimate (EUR)** |
| 8 travels to present results to TC ITS meetings and ITS CG | 6 649,03 |
|  | **6 649,03** |

## Cost of consumables and supplies necessary to implement the action

N/A

## Other costs and services necessary to implement the action

N/A

## Subcontracting to external organisations

N/A