



**INTERNATIONAL ELECTROTECHNICAL COMMISSION**

**TECHNICAL COMMITTEE NO 100: AUDIO, VIDEO AND MULTIMEDIA  
SYSTEMS AND EQUIPMENT**

**ADVISORY GROUP on STRATEGY**

**Report of SEG-1, Smart Cities, after their meeting held on 28 February 2014 in Berlin,  
Germany**

Source: SMB/5302A/R

Background: This document was provided by Dr. S. Hirakawa for TC 100/AGS members' review.

Date: 2014-05



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SMB/5302A/R

2014-05-02

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### STANDARDIZATION MANAGEMENT BOARD

#### SUBJECT

**SMB meeting 150, agenda item 5.1, Frankfurt**

Report of SEG-1, *Smart Cities*, after their meeting held on 28 February 2014 in Berlin, Germany

#### BACKGROUND

Systems Evaluation Group-1 (SEG-1) held its second meeting on 2014-02-28; its next meeting is planned for September 2014 in the United States.

The report is in two parts:

**Part A** – SEG-1 recommendations submitted to the SMB for formal approval: none.

**Part B** – For SMB information for its meeting to be held in Frankfurt, SMB SEG-1 submits the following report with an update of its current activities.

#### ACTION

The SMB is invited to note the information provided in the report from SEG-1 meeting and **to submit any comments**, using the IEC Technical Server, **before 2014-05-30**.

## Part A: Recommendations for approval

None

## Part B: Information

The following report summarizes the main discussions and achievements of the second Systems Evaluation Group-1 meeting which was attended by 47 members:

### B.1 Task of SEG-1

The convenor revisited the purpose, scope, organizational structure and workflow of SEG-1 agreed in the first plenary meeting held in December 2013.

It was confirmed that 3 Task Groups (TG) had been established in the first plenary meeting of SEG-1 with following work allocation:

	Works to be done	Leader
TG1	- Inventory of relevant existing standards - Survey and collection of existing and to-be-defined evaluation, metrics and Terms & Definitions - Survey of smart city strategies	CN
TG2	- Reference architecture - Generic use cases - Supplemental research	DE
TG3	- Roadmap - Mapping of closely related activities - Definition of terms to be shared in SEG	JP

Working Groups (WG) will be established based on specific city challenges. As reported to the SMB, the WG results will become the core part of SEG-1's final report to SMB, because the future proposal of SyC on Smart Cities will consist of WG results. TG activities will support it. This was challenged during the meeting by a member who suggested that it should be stated in the reverse way, namely that the future proposal of SyC on Smart Cities will consist of TG results and that WG activities will support it.

### B.2 Task Group Actions

Task Group 1:

Dr Wei Sun is the leader of TG 1. The action plan of TG 1 is the following:

- Inventory of relevant existing standards;
- Survey and collection of existing and to be defined evaluation, metrics and terms and definitions; To be circulated to SEG-1, NCs and TC/SCs in April 2014
- Survey of smart city strategies.
- Regarding terms and definitions, it was clarified that TG 1 will focus on collecting existing ones, instead of developing new ones and of requesting other SDOs to adopt them.

Task Group 2:

Ms Yuanchao Chen is the leader of TG 2. The task of TG 2 is, to evaluate needs for a possible SyC, to discuss a reference architecture model based on generic use cases from WGs work on scenarios or challenges in cities, considering diversities among countries and the importance of having a common model at international level. This task started at the first meeting of TG 2 on 27 February 2014. Drafting of reference architecture would be continuously undertaken by the possible SyC, taking into account the limited scope and lifetime of SEG-1.

TG 2 will also conduct supplementary research on specific cases, where WG activities are not planned but could provide potential knowledge to the reference model.

TG 2 will assist CAG and TG 3 in identifying gaps in standardization development and compiling the Smart Cities (SmC) standardization roadmap.

Task Group 3:

Dr Ueno is the leader of TG 3 and the convenor of SEG 1. The action plan of TG 3 is to assist the Convenors Advisory Group in compiling Smart City Standardization roadmap based on the output from WGs and TGs. TG 3 will conduct the mapping of closely related activities to the extent that is needed to report the necessity of a SyC in the field of Smart Cities. TG 3 will also develop and maintain the specific terms and definitions to be shared in SEG 1.

### **B.3 New Working Group Proposals**

SEG-1 established 7 Working Groups. The SEG 1 WGs are working entities that provide substantial inputs to SEG 1 Task Groups through the SEG 1 Convenors Advisory Group, for the preparation of draft final reports to the SMB.

The WGs are:

1. City Service Continuity
2. Urban planning and simulation system
3. City facilities management (CFM)
4. Use case – Smart Home
5. Use Case – Smart Education
6. Smart Cities Assessment
7. Standards development for smart cities using the City of Johannesburg- in a rapidly emerging country- as a piloting benchmark for smart cities implementation

The Working Groups and Task Groups will hold meetings on 5 & 6 June 2014 in Wanning, Hainan Province, China.

### **B.4 Terms of Reference**

SEG-1 confirmed that the following terms and working definitions for SEG 1 were proposed and approved in the first plenary meeting. (SmC stands for Smart Cities).

**SmC-Challenge:** City issue that city stakeholders face and to be addressed

**SmC-Scenario:** Story to describe SmC-Challenge and the outline of the possible approaches to solve it

**SmC generic use case:** Documented SmC-Scenario

**Use Case:** Class specification of a sequence of actions that a system (or an entity) can perform, interacting with actors of the system (IEC 62390:2005-01)

**SmC-Reference architecture:** Conceptual structure of a system to implement an SmC-Scenario in order to be referred by relevant documents

**SmC-Gap identification:** Analysis of the difference between current standards and the ones necessary for the SmC-Scenario and SmC-Reference architecture

**SmC-Standardization Roadmap:** List of possible future standardization items in electrotechnical fields with a timeline based on the gap identification, which may include the work allocation to SyCs, TC/SCs.

The updated SEG-1 Terms of Reference document is attached as Annex A of this report.

### **B.5 Liaisons**

Roles of liaison from SEG-1 to other technical bodies were discussed and agreed as follows:

- Provide information of SEG-1 activity and progress to other technical bodies
- Make presentation (if available) in the meetings of other technical bodies.
- Acquire information about the progress of other technical bodies.

Liaison officers from SEG-1 to other SDOs were nominated and approved as follows:

- IEC/SyC on Smart Energy: Dr Fumio Ueno
- IEC/MSB smart city whitepaper group: Dr Fumio Ueno
- ITU-T/SG 5/FG-SSC: Ms Yuanchao Chen
- JTC 1/SG 1 on Smart cities: Ms Sun Wei
- ISO/TC 268: Mr Isao Endo
- ISO/TC 268/SC 1: Dr Yoshiaki Ichikawa

## **ITU-T**

The FG-SSC was established at the ITU-T Study Group 5 meeting in Geneva in February 2013. Mr. Flavio Cucchiatti, Vice-chairman of the ITU-T Focus Group on Smart Sustainable Cities (FG-SSC) presented on the activities of this group.

Mr Cucchiatti reported that Smart Sustainable Cities are a complex ecosystem with many different technologies and expertise, and is considered as a new and huge challenge to SDOs. A key aspect in his presentation was about sharing documents. The proposal was not only to share finalized documents, but envisaged to start a joint development of deliverables. This would allow avoiding duplication and will allow both ITU and IEC to benefit from the skills of the respective experts;

Another key suggestion from Mr Cucchiatti's presentation was to organize back to back meetings and joint sessions – SEG1 was offered the possibility to hold a full or partial meeting in the same venues where ITU-T FG-SSC had already planned to hold its meetings (Genoa 06/2014) or London (09/2014).

Mr Cucchiatti's was thanked for the offer; however SEG-1 had previously accepted invitations to hold its Working Group and Plenary meetings elsewhere. According, Ms Yuanchao Chen, (SEG-1 co-convenor) will attend the ITU-T FG-SSC meeting in Genoa as liaison officer of SEG-1.

## **SEG-2 and MSB Smart Cities**

Close coordination with both SEG-2 Smart Grid and the MSB Smart Cities white paper project team is recognized as essential. Convenor Ueno is actively participating on both the MSB Smart Cities team, and SEG-2. Mr Lanctot is Secretary to both SEG-2 and the MSB, and also reports on the relevant activities of these groups.

## **B.5 Future activities**

The task groups and working groups will immediately begin their work and report their activities at the next SEG-1 meeting in September 2014.

## ANNEX A

### SEG-1 ToR

#### Terms of Reference of SEG1 - Smart Cities

(Red = revised text from 2014-02-28 SEG1 plenary meeting)

#### 1. Background

SMB agreed to set up an SEG (Systems Evaluation Group) on Smart Cities as proposed in document SMB/5025/DC. SMB decided the convenorship should be agreed amongst the proposers (DE, CN JP). The purpose of this evaluation group is to summarize and evaluate the status of standardization in the field of smart cities (inside and outside IEC and ISO), and work out plans for new standardization work to be taken in IEC.

#### 2. Scope

IEC SEG1 on Smart Cities will evaluate relevant works to evaluate and determine the need to establish an SyC with regard to Smart Cities including the SyCs scope, relevant generic use cases, a possible reference architecture model, a standardization roadmap\* , a survey and collection of existing and to-be-defined evaluation, metrics and terms & definitions, and a mapping of closely related activities in cooperation with IEC internal technical bodies, ISO and other organizations, fora and consortia.

\*including gap identification

#### 3. Timeline

SEG1 will provide a final report to SMB about the establishment of a SyC (or SyCs) within 24 months from June 2013. The detailed timeline is shown as Annex1.

Note: The final report may propose to not establish a SyC if no need for a SyC is identified.

#### 4. Basic Approach

The basic approach or attitude of SEG1 is goal-oriented, in other words hypothesis verification. The work items and structure of SEG1 shall be designed to verify the necessity of potential or possible SyC as a hypothesis.

The possibility is for a SyC (hypothesis) to be derived from city-opportunities or city-issues that cities are now facing or will face in the future. SEG1 should search for an area which needs systems approach, from user need-oriented viewpoints, rather than bottom-up technical area based approach.

SEG1 focuses on possible SyC areas that are proposed by members with justifications. The justification should include a) city-opportunities or city-issues, b) possible approach to solve them, and c) explanation of how the approach is relevant to electrotechnical standardization (IEC areas) and systems approach (standardization from the viewpoint of *System of Systems*). SEG1 may propose to not establish a SyC if no need for a SyC is identified as a result of 24 months of activities. This is to avoid proposing a standardization area with no perceived needs, or a redundant or overlapping organizational structure with existing TCs/SCs in IEC and other organizations.

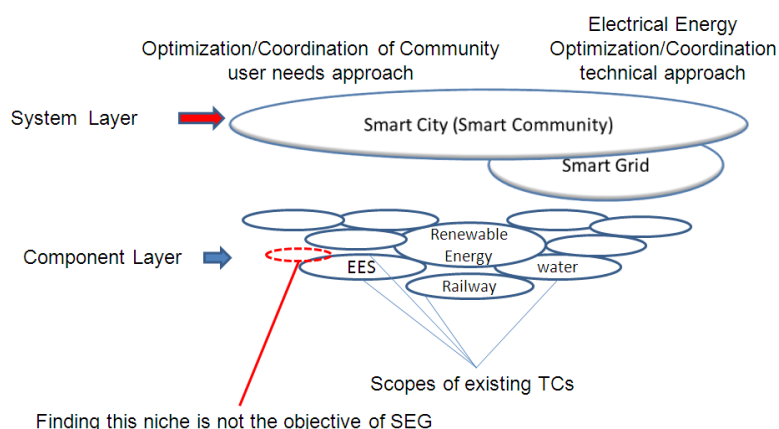


Figure 4.1

## **5. Specific Terms & Definitions for SEG1 on Smart Cities**

\*SmC stands for *Smart Cities*

### **5-1. SmC-Challenge**

City issue that city stakeholders face and to be addressed

### **5-2. SmC-Scenario**

Story to describe SmC-challenge and the outline of the possible approaches to solve it.

### **5-3. Generic use case**

Documented SmC-Scenario

### **5-4. Use case**

Class specification of a sequence of actions including variants that a system (or an entity) can perform, interacting with actors of the system (IEC 62390, ed. 1.0:2005-01)

### **5-5. SmC-Reference architecture**

Conceptual structure of a system to implement a SmC-Scenario in order to be referred by relevant documents

### **5-6. Gap identification**

Analysis of the difference between current standards and the ones necessary for the SmC-Scenario and SmC-Reference architecture.

### **5-7. SmC-Standardization roadmap**

List of possible future standardization items in electrotechnical fields with a timeline based on the gap identification, and recommendations which may include the work allocation to SyCs, TCs/SCs.

## **6. Organizational Structure**

### **6.1 General**

SEG1 is comprised of representatives from members from within IEC and those from outside of IEC.

#### **a) Members from inside of IEC**

The membership of SEG1 is open to all TCs, SCs and NCs of IEC. SEG1 may invite representatives from IEC/SEG2 on Smart Grid and IEC/MSB Smart city. Members act as experts and not as a NC or TC delegate.

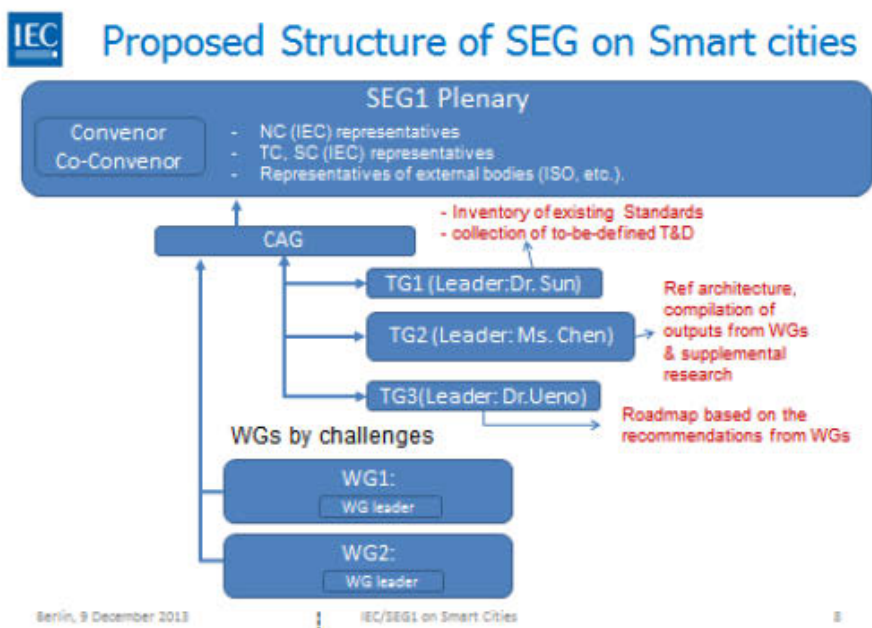
#### **b) Members from outside of IEC**

SEG1 may also include members from outside of IEC, considering the relevance to the scope of SEG1 and possible SyC areas to be discussed in this SEG1. SEG1 recognizes the importance of communication with an association of cities in higher level discussion.

The possible external members to be invited are as follows:

- ISO/TC 268/SC 1 Smart community infrastructures
- ISO/TC 207 Environmental management
- ITU-T/SG 5/FG on Smart and Sustainable Cities
- ISO/IEC/JTC 1/SG on smart cities
- ICLEI
- SSCC-CG
- IEEE

SEG1 has the organizational structure described in Fig.6.1. The details of each entity are described in following clauses.



**Figure 6.1 Organizational structure of SEG1**

## **6.2 SEG1-Plenary**

### **6.2.1 General**

SEG1-Plenary reviews and approves SEG1-WG proposals. SEG1-Plenary reviews and approves the final documented proposal of SEG1 to SMB.

### **6.2.2 Membership**

SEG1-Plenary is open to all SEG1 members.

### **6.2.3 Decisions**

The decisions in SEG1 meetings are based on consensus of the SEG1 members present. However, a voting can be conducted to confirm the consensus upon the request of a SEG1 member. In the voting, consensus is deemed to be reached by the simple majority of members' present excluding abstention. In the voting, one member present has one vote. The number of votes agreed, disagreed and abstention shall be recorded.

If more than one-third of member's present vote negative in the approval of the draft final report to SMB, the facts and minority opinions will be recorded in the final report.

### **6.2.4 Procedure to circulate documents**

All documents from SEG1, SEG1-CAG, SEG1-TGs shall be circulated under the name of the convener of SEG1 upon the consensus among the convener and the co-conveners to avoid confusing the recipients of the documents.

All documents (including questionnaires from a TG) shall be submitted to convener and co-conveners of SEG1 for approval, and then be circulated through the secretary of SEG1 to inside and/or outside of IEC.

## **6.3 SEG1-Convener Advisory Group (SEG1-CAG)**

### **6.3.1 General**

SEG1 has a Convener's Advisory Group (CAG) to support the convener and co-conveners of SEG1. One of the major roles of SEG1-CAG is to support the convener to prepare a draft proposal to SMB which is to be circulated in advance to members and reviewed by SEG1.

### **6.3.2 Membership**

The participation to SEG1-CAG should be by the invitation by the convener. The members of SEG1 from outside of IEC can be invited as well as those from inside of IEC, if the convener requires. Each SEG-CAG member can appoint an alternate for him or her.

Members of the CAG automatically include SEG1 Officers and WG leaders.



### 6.3.3 Detailed Function

SEG1-CAG reviews new working group proposals submitted to the convener of SEG1 to ensure the proposal apparently suffice the criteria to be the subject matter of SEG1-WGs.

The criteria of review are:

- Whether the proposal addresses Cities relevant cross-cutting issues.
- Whether the proposal is apparently relevant to IEC (electrotechnical) field.
- Whether the proposal needs Systems approach.

SEG1-CAG recommends the new working group proposal to SEG1-plenary for approval if it apparently suffices the above criteria.

SEG1-CAG is responsible for supporting SEG convener to compile draft report to SMB which is based on the inputs from SEG1-WGs and needs to be approved by SEG1-plenary.

SEG1-CAG will make recommendations to the SEG; it does not make decisions for the SEG.

## 6.4 SEG1-Task Groups (SEG1-TGs)

### 6.4.1 General

SEG1-CAG establishes SEG1-TGs to subsidize its work to review and compile inputs from SEG1-WGs and develop a recommendation or a draft to be discussed in SEG1-plenary. Therefore, the major task of SEG1-TGs is to compile inputs from SEG1-WGs, rather than conducting independent research. However, SEG1-TGs will conduct relevant preparatory works before receiving inputs from SEG1-WGs so as to supplement the inputs from SEG1-WGs.

### 6.4.2 Membership

~~SEG1-TGs are open to all SEG members. comprise SEG1-CAG members and those who nominated by the leader of the SEG1-TGs.~~ The leader of an SEG1-TG shall be one of convener and co-conveners of SEG1. The call for participation shall be distributed through the secretary of SEG1.

### 6.4.3 Work allocation

SEG1 has three SEG1-TGs and their works and leaders are shown in Fig.6.4. The detailed action plans of TG1, TG2 and TG3 are provided in Annex 4, 5 and 6

	Works to be done	Leader
TG1	- Inventory of relevant existing standards - Survey and collection of existing and to-be-defined evaluation, metrics and Terms & Definitions - Survey of smart city strategies	CN
TG2	- Reference architecture - Generic use cases - Supplemental research	DE
TG3	- Roadmap - Mapping of closely related activities - Definition of terms to be shared in SEG	JP

Figure 6.4 Task Group Work Allocation

## 6.5 SEG1-Working Groups (SEG1-WGs)

### 6.5.1 General

SEG1-WGs are responsible for preparing **substantial** inputs to SEG-TGs through SEG1-CAG. The inputs shall include:

- Outline of the SEG1-WG including title, members and SmC scenario of the SEG1-WG.

- Recommendations to IEC/SEG 1/CAG including suggested standardization items to be developed under the possible SyC on Smart Cities relevant to the SmC scenario of the SEG1-WG.
- Justification for the recommendation including SmC-reference architecture, current status of standardization activities and gap identification relevant to the SmC-scenario of the SEG1-WG.

The input from a SEG1-WG should follow the reference templates provided in Annex3.

#### 6.5.2 Establishment of SEG1-WG

An SEG-WG shall be established by a proposal from a member of SEG1. The proposal should be based on SmC-opportunities (community issues, user needs or combination of systems) rather than technical areas, e.g. building, energy or transportation.

The proposal shall be submitted to the convener of SEG using Form A (Annex2). The proposal will be reviewed by SEG1-CAG to ensure the proposal satisfies predetermined requirements before being reviewed and approved by SEG1-Plenary. **SEG1-CAG is responsible for avoiding overlap among WG works.**

The proposer should be responsible for providing the leadership and necessary resources for the WG activities.

#### 6.5.3 Membership

An SEG1-WG is open to all SEG1 members. The leader of an SEG1-WG may invite experts from outside of SEG1. The involvement of a city representative is recommended to correctly understand the SmC challenge which the SEG1-WG addresses. **The call for participation shall be distributed through the secretary of SEG1 upon the request of the leader of a SEG1-WG.**

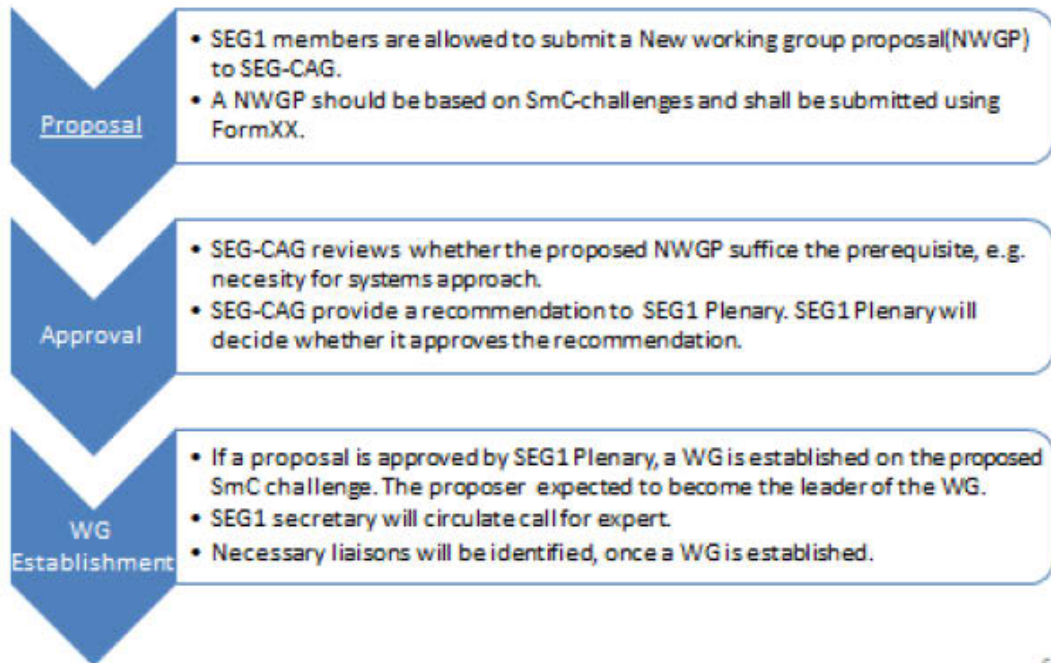
**SEG1-CAG is responsible for monitoring WGs have sufficient number and mixture of backgrounds of experts. The member lists of SEG1-WGs shall be shared to SEG1 members.**

#### 6.5.4 Review

**SEG1-WGs are requested to provide interim reports at least two weeks before the third plenary meeting for commenting by all SEG1 members. The interim reports shall be provided using the reference template (annex 3). SEG1-CAG is responsible for guiding SEG-WGs to ensure the progress reports are sufficiently mature. SEG1-plenary reviews the interim reports and decide whether the activities shall be continued and provide recommendations for the final inputs.**

**SEG1-WGs are requested to share their working materials to SEG1 members through IEC collaboration system.**

# Workflow of SEG



6

**Fig 6.5 Procedure to establish a SEG-WG**

#### **6.6 Relation between SEG1-WGs and SEG1-TGs**

SEG1-WGs are working entities to provide substantial inputs to SEG1-TGs through SEG1-CAG for the preparation of draft final report to SMB because the necessity of the establishment of SyC shall be discussed from the viewpoint of SmC-scenarios.

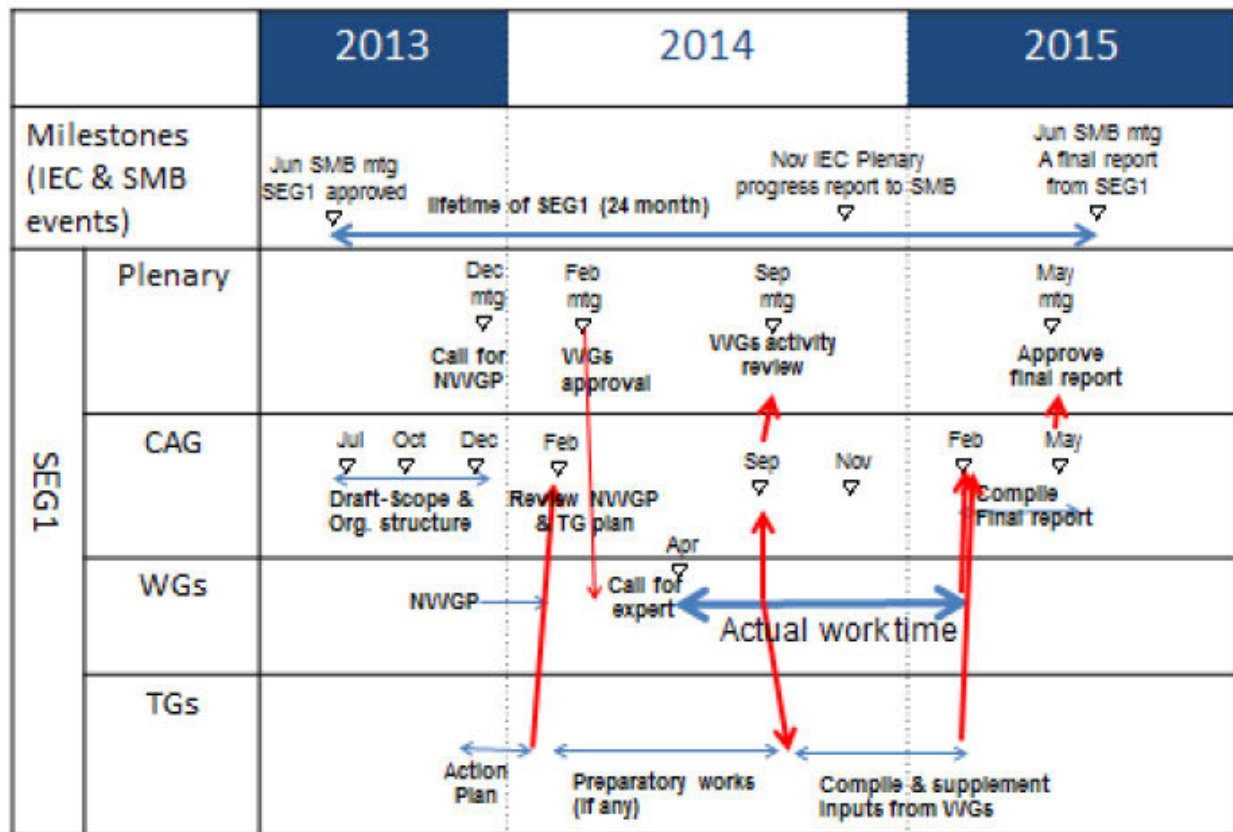
SEG1-TGs are responsible for preparing draft-report regarding their assigned tasks.

SEG1-TGs may supplement the inputs from SEG1-WGs to assure that the final report to SMB is sufficiently comprehensive to suggest or not suggest establishing a SyC in the field of smart cities.

WGs and TGs should work closely together, sharing working drafts with each other in order to ensure consistency in the approach.

TG2 should have participation from each relevant WG.

# Annex 1 Detailed timeline for SEG 1



1