# IEEE 802 LAN/MAN STANDARDS COMMITTEE (LMSC)

# CRITERIA FOR STANDARDS DEVELOPMENT (CSD) For Proposed Project 802.15.7a Optical Camera Communications (OCC)

Based on IEEE 802 LMSC Operations Manuals approved 18 July 2014

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# IEEE 802 criteria for standards development (CSD)

The CSD documents an agreement between the WG and the Sponsor that provides a description of the project and the Sponsor's requirements more detailed than required in the PAR. The CSD consists of the project process requirements, 1.1, and the 5C requirements, 1.2.

## Project process requirements

### Managed objects

Describe the plan for developing a definition of managed objects. The plan shall specify one of the following:

1. The definitions will be part of this project. Yes. This PHY provides an interface between the MAC sublayer and the physical optical channel. The PHY conceptually includes a management entity called the PLME. This entity provides the layer management service interfaces through which layer management functions may be invoked. The PLME is also responsible for maintaining a database of managed objects pertaining to the PHY.
2. The definitions will be part of a different project and provide the plan for that project or anticipated future project.
3. The definitions will not be developed and explain why such definitions are not needed.

### Coexistence

A WG proposing a wireless project shall demonstrate coexistence through the preparation of a Coexistence Assurance (CA) document unless it is not applicable.

1. Will the WG create a CA document as part of the WG balloting process as described in Clause 13? (yes/no) Yes
2. If not, explain why the CA document is not applicable.

## 5C requirements

### Broad market potential

Each proposed IEEE 802 LMSC standard shall have broad market potential. At a minimum, address the following areas:

1. Broad sets of applicability.

There is a growing need to increase the degree of connectivity of mobile devices, both new and existing, to support a growing set of applications, but doing so without overloading existing RF spectrum or requiring additional hardware. Off-loading is an important part of today’s mobile networking infrastructure.

OCC based solutions to this problem address a significant opportunity, extending to billions of existing devices, to provide secure non Radio Frequency (RF) based communications capability between mobile devices and/or between mobile devices and fixed infrastructure on either a one to one, or one to many or many to one basis. Using light frequencies rather than RF allows for significant additional unlicensed bandwidth without RF interference. The ability to use existing hardware for many applications contains the cost.

Potential applications include secure point-to-point communication, Location Based Services (LBS), secure point-to-multipoint communication (office, hospital, air plane), Intelligent Transportation Systems (ITS), General Information Broadcasting, Line-of-Sight (LOS) marketing, Augmented Reality, LED-ID, IoT (Internet of Things), M2M, D2D, and many more.

1. Multiple vendors and numerous users

The various institutions and companies participating in the IEEE P802.15.SG 7a OCC Study Group demonstrate the broad interest in the utilization of non-fiber based light communication technologies. Participating members in the study group include wireless carriers, system integrators, consumer electronics companies, mobile device manufacturers, lighting manufacturers, silicon providers, potential end users, and academic researchers.

### Compatibility

Each proposed IEEE 802 LMSC standard should be in conformance with IEEE Std 802, IEEE 802.1AC, and IEEE 802.1Q. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with IEEE 802.1 WG prior to submitting a PAR to the Sponsor.

1. Will the proposed standard comply with IEEE Std 802, IEEE Std 802.1AC and IEEE Std 802.1Q? No
2. If the answer to a) is no, supply the response from the IEEE 802.1 WG. The review and response is not required if the proposed standard is an amendment or revision to an existing standard for which it has been previously determined that compliance with the above IEEE 802 standards is not possible. In this case, the CSD statement shall state that this is the case.

### Distinct Identity

Each proposed IEEE 802 LMSC standard shall provide evidence of a distinct identity. Identify standards and standards projects with similar scopes and for each one describe why the proposed project is substantially different.

With the exception of 802.11 IR, this project is distinguishable from all other IEEE 802 standards due to its unique spectral band from 190nm to 10,000nm in wavelength and the fact that it is physical media independent, i.e. “wireless”. Beyond 802.11 IR, we are unaware of any standards that address free space communication in this wavelength range. Even with the overlap in frequency of operation with 802.11 IR, 15.7a targets a totally different application set which is not addressable by 802.11 IR.

### Technical Feasibility

Each proposed IEEE 802 LMSC standard shall provide evidence that the project is technically feasible within the time frame of the project. At a minimum, address the following items to demonstrate technical feasibility:

1. **Demonstrated system feasibility:**   
   There have been sufficient test results, demonstrations, and simulations, both academic and commercial, verifying that OCC implementations are feasible.
2. **Proven similar technology via testing, modeling, simulation, etc.**

The components used for OCC are widely used in illumination and other applications and are produced in large volumes, showing that the technologies required are proven. Fabrication and testing techniques are used for volume manufacture of optoelectronic components, showing that the testing required is reasonable.

### Economic Feasibility

Each proposed IEEE 802 LMSC standard shall provide evidence of economic feasibility. Demonstrate, as far as can reasonably be estimated, the economic feasibility of the proposed project for its intended applications. Among the areas that may be addressed in the cost for performance analysis are the following:

1. **Balanced costs (infrastructure versus attached stations)**

No changes (or at most minor changes) to existing infrastructure are required to support this capability

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1. **Known cost factors**

This is intended for devices, such as mobile devices, which are well known and characterized in terms of cost. Implementation of the standard will have little to no impact on the current cost model.

1. **Consideration of installation costs.**

Essentially none

1. **Consideration of operational costs (e.g., energy consumption).**  
   Essentially none
2. **Other areas, as appropriate.**

None