

ConOp Appendix 1, High-Level Requirements

These requirements respond to the Concept of Operations at a high level, meaning that the requirements address broad capabilities required for the Performance Measurement Project component. These requirements provide the basis for detailed functional requirements to be documented and fulfilled as part of the design of specific projects that carry out the travel time measurement using Bluetooth reader program.

Some of the requirements pertain to the ASCT, and are shown here to provide input to ASCT development efforts. ASCT requirements are beyond the scope of this document.

Traceability is explicitly shown in a separate document that serves as a companion to this Appendix, titled System Performance Measurement Using Bluetooth Readers Requirements Traceability.

1. Bluetooth Reader Requirements

1.1. Bluetooth MAC Identification

1.1.1. Bluetooth MAC Reads

The Bluetooth reader shall be capable of monitoring and measuring vehicular movement by identifying and comparing unique MAC (Media Access Control) addresses associated with Bluetooth-enabled electronic devices.

1.1.2. Bluetooth MAC Anonymity

The MAC address shall not be linked to a specific person through any type of central database, and shall be assigned by the Bluetooth electronic chip manufacturer and shall not be tracked through the sales chain.

1.1.3. Reader Installation Requirement

The Bluetooth reader shall be compact and easy to install.

1.1.4. Bluetooth Reader Locating

The Bluetooth reader shall be located to allow for proper estimation of travel time from the sign location to the named destination.

1.1.5. MAC Read Range

The Bluetooth reader shall have effective MAC information read range of greater than 350 feet from the reader location

2. Software Requirements

2.1. Interface Requirements

2.1.1. Operator Interface

**Orange County Adaptive Signal System –
Performance Measurement Using Bluetooth Readers**

The graphical user interface as part of the operational software package shall be easy to operate and configure

2.1.2. Software Integration

The software shall be easily integrated with both the existing and future versions of Sunguide system allowing for both TCP and UDP connections

2.1.3. Network Communications

All devices shall communicate via Ethernet (IEEE 802.3) with adherence to NTCIP (No serial Communications)

3. Maintainability Requirements

3.1. Bluetooth Reader Maintenance Diagnostics

The Bluetooth Reader software shall provide diagnostic information for TMC operators and technicians for troubleshooting up to and including:

- Number of MAC reads
- Number of MAC matches
- Reader environmental information

3.2. Bluetooth Reader Reparability

The Bluetooth reader shall be designed to allow for board level repair. Boards will be returned to manufacturer for component level repair

3.3. Bluetooth Reader Reliability

The DMS shall be designed for a field serviceable lifespan of 10 years (this means that all sign components not expected to be renewed as a part of normal maintenance shall have a mean time between failures of 100,000 hours).

3.4. Durability

The DMS shall be designed for a field serviceable lifespan of 10 years (this means that all sign components not expected to be renewed as a part of normal maintenance shall have a mean time between failures of 100,000 hours).

3.5. Preventive Maintenance

The Bluetooth Readers shall be designed to avoid the need for preventive maintenance visits more frequently than at one-year intervals. This means that maintenance intervals for air filters and other identified and approved routine service items shall be a minimum of 10,000 hours of operation.