

## Orange County Adaptive Signal System

### Performance Measurement Using Bluetooth Readers Project Requirements Traceability Table

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#### Requirements Traceability Matrix

The table shown below provides requirements traceability to the user needs as documented in the System Performance Measurement Using Bluetooth Readers Concept of Operations, and the High-Level Requirements which are an Appendix to that document. The table is designed to be used for documenting functional requirements and design elements as the project proceeds.

Each column references the version of the document from which it is drawn.

User Need	ConOps Section	High-Level Requirement Number and Title	High Level Requirement
Concept of Operation 1.1	ConOps 1.1	Ver 1	Ver 1
Bluetooth Reader Collection Station Needs	4.1		
Identify Unique MAC Address	4.1.1	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.
Bluetooth MAC Information Anonymity	4.1.2	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.
Non-Intrusive Simple Installation	4.1.3	1.1.3 Reader Installation Requirement	The Bluetooth reader shall be compact and easy to install
Bluetooth Reader Locating	4.1.4	1.1.4 Bluetooth Reader Locating	The Bluetooth reader shall be located to allow for proper estimation of travel time from the signal location to the named destination
Software Needs	4.2		
Operator Interface Needs	4.2.1	2.1.1 Operator Interface	The graphical user interface as part of the operational software package shall be easy to operate and configure
Software Integration	4.2.2	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
IP Network	4.2.2	2.1.3 Network Communications	All devices shall communicate via Ethernet (IEEE 802.3) with adherence to NTCIP (No serial Communications)

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Concept of Operation 1.1	ConOps 1.1	Ver 1	Ver 1
<b>Bluetooth Reader Reliability</b>	4.2.3		
The Bluetooth reader needs to function reliably	4.2.3	3.3 Bluetooth reader Reliability	The Bluetooth readers need to function properly in all ambient conditions of temperature and humidity
One reader needs to cover entire intersection reading Bluetooth MAC information in all directions	4.2.3	1.1.5 MAC Read Range	The Bluetooth reader shall have an effective MAC information read range greater than 350 feet from reader location
<b>Bluetooth Reader Reparability</b>	4.3.3		
Board level repair	4.3.3	3.3 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
<b>Bluetooth Reader Maintenance Diagnostics</b>	4.3.4		
Technicians and operators need to be able to diagnose problems	4.3.4	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: <ul style="list-style-type: none"> <li>• Number of MAC reads</li> <li>• Number of MAC matches</li> <li>• Reader environmental information</li> </ul>
<b>Integration and Configurability Needs</b>	4.4		
<b>Bluetooth Operational Configuration</b>	4.4.1		
TMC operators / technicians need to be able to configure the Bluetooth readers and software	4.4.1	2.1.1 Operator Interface	The Bluetooth reader and software shall be designed to allow for user configurable parameters
The Bluetooth reader needs to send reads to off-site server for travel time calculations	4.4.2		The Bluetooth reader shall be designed to send all of its MAC read information to an off-site server for travel time calculations on a minute-by-minute basis
<b>Physical Construction Needs</b>	4.5		
<b>Bluetooth Reader Positioning</b>	4.5.1		
Bluetooth readers need to be positioned to accurately calculate travel times	4.5.1		The Bluetooth readers shall be positioned at signalized intersections with a minimum spacing of quarter a mile.