OM-13: Transportation Management and Operations

1-15 points

Goal: Maximize the utility of the existing roadway network through use of technology and management of operations strategies.

Affected Triple Bottom Line Principles

Sustainability Linkage

Transportation management and operations support all of the triple bottom line principles. More efficient operations of the roadway network will result in a reduction of fossil fuel usage and related emissions; a reduction in the number and severity of crashes and therefore congestion and private and public property loss, injury, and loss of life; and a reduction in the resources and related costs needed to expand capacity of the network.

Background and Scoring Requirements

This criterion, OM-13: Transportation Management and Operations, covers the management and operations (M&O) of existing infrastructure through the use of Intelligent Transportation Systems (ITS). Other related criteria that also include ITS strategies include:

- OM-03 Vehicle Fuel Efficiency and Use – includes ITS strategies to reduce fuel usage of fleet vehicles;
- OM-07: Pavement Management System – includes ITS strategies to inventory and manage pavement assets;
- OM-08: Bridge Management System – includes ITS strategies to inventory and manage bridge assets;
- OM-11: Traffic Control Infrastructure Maintenance – includes the preservation and maintenance of permanent traffic control, ITS, and safety devices;
- OM-12: Road Weather Management Program – includes ITS strategies to monitor weather, manage events, and efficiently operate and maintain the transportation system during weather events; and
- OM-14: Work Zone Traffic Control – includes ITS strategies related to M&O related temporary traffic control

For the purposes of INVEST, ITS strategies are included in specific topical criteria first, and more general solutions are included in OM-13.

Background

The intent of this criterion is to encourage the use of available technologies to actively manage and operate the existing roadway infrastructure, alleviating the major causes of congestion, including insufficient capacity (bottlenecks), substandard transportation operations systems (such as traffic signal systems with poor signal timing), incidents (crashes, disabled vehicles), and non-recurring events (special events, work zones, weather-related events, etc.).

For the purpose of this criterion, the key terms are defined as follows:

- **"Intelligent Transportation Systems (ITS)"** are advanced applications that provide innovative services relating to different modes of transport and traffic management and enable system users to be better informed and make safer, more coordinated, and 'smarter' use of technology-based transportation networks.

- **"ITS Architecture"** defines how systems functionally operate and the interconnection of information exchanges that must take place between these systems to accomplish transportation services. An architecture is functionally oriented and not technology-specific which allows the architecture to remain effective over time. It defines "what must be done," not "how it will be done."
- **"ITS Standards"** define an architecture of interrelated systems that work together to deliver transportation services.
- **"National ITS Architecture"** provides a common framework for planning, defining, and integrating ITS. It defines the functions that must be performed by subsystems, where these functions reside (e.g., field, traffic management center, in vehicle), the interfaces and architecture flows to/from the subsystems, and the communications requirements for the architecture flows. It is a mature product that reflects the contributions of a broad cross-section of the ITS community (e.g., transportation practitioners, systems engineers, system developers, technology specialists).

Scoring Requirements

The strategies included in the following scoring requirements will vary in size and scope depending on the needs of the agency. The strategies could be comprised of a combination of various documents that cover M&O of different conditions or regions, or could be a single, consolidated document. For the purposes of evaluating this criterion, the agency should consider all applicable documents in aggregate and respond according to the majority of their practices.

Requirement OM-13.1

2 points. Conduct Enhanced or Expedited Compliance

The agency takes steps or measures beyond (enhanced) or faster than (expedited) what is required under existing operations regulations and certifications to improve mobility and user level of service. Existing regulations and certifications include Congestion Management Process, Real Time Traveler Information, and the Manual on Uniform Traffic Control Devices. Examples of measures that enhance compliance include adopting demand management strategies, such as congestion pricing strategies and high-occupancy toll (HOT) lanes, which are encouraged but not required under the Congestion Management Process. Enhancements might also include programs that encourage transit use and ridesharing.

Requirement OM-13.2

1-6 points. Include Operation-Based Strategies and Programs

The agency has in place system-wide strategies, for enhancing the mobility and safety of the existing roadway network. These strategies increase user level of service and roadway capacity, and decrease collisions and their effects on mobility. Strategies include ITS functions and the programs in place to implement and support their use. Information about ITS functions that can be used to support these strategies can be reviewed at the FHWA Office of the Assistant Secretary for Research and Innovative Technology (OST-R) Intelligent Transportation Systems Joint Program Office's Application Area Website[1]. Table OM-13.2.A shows the ITS application areas and ITS functions available for this criterion.

Utilize one or more ITS functions, as listed in Table OM-13.2.A, in support of the application areas listed. Points are awarded based on how many application areas are supported system-wide (or in a majority of areas identified as relevant). Multiple ITS functions in one application area do not achieve additional points. Points for supporting application areas are cumulative; however, this criterion **shall not exceed a total of six points**.

To determine points, it is important to review the definition of the application areas, the function, and the technology. The application areas are defined on the aforementioned ITS Application Area Website[1]. To better understand the function and technologies, select the application area name, then, on the ITS Taxonomy page for that application area, select the desired function or technology. At the top of each page that describes a particular function or technology, there is a "What is this?" description. This defines the function or technology being scored. For example, the technology labeled "HOV Facilities" within the Lane Management function, is described as "Sensors detecting the traffic conditions support the use of dynamic message signs and moveable barriers (e.g., gates) to control the operation of HOV facilities." Therefore, points are not provided for merely having HOV facilities, but utilizing ITS to monitor and control the facilities. In addition, the implementation of ITS functions included in Table OM-13.2.A will vary in size and scope depending on the needs of the agency; while a particular function or technology itself may be utilized, it may not be used fully in all possible ITS application areas; ensure this is reflected correctly in determining points.

The implementation of technologies to support M&O strategies may vary from test projects, to regional improvements, to statewide implementation both as applicable/relevant and as the agency is rolling-out or testing specific technologies. Some technologies may have greater relevance to urban areas or rural areas and vice versa. For the purposes of evaluating this criterion, the agency should consider whether the technologies are ***implemented in a majority of the relevant areas***.

TABLE OM-13.2.A ITS TECHNOLOGIES (CONTINUED ON NEXT PAGE)

Requirement	Points	Application Area	Functions (If Itemized, Shown Technologies ONLY)
OM-13.2a	1	Arterial Management	**Information Dissemination** (In-Vehicle Systems) **Lane Management** **Surveillance** (Infrastructure) **Traffic Control** (Adaptive Signal Control*, Bicycle and Pedestrian**, Special Events, Variable Speed Limits)
OM-13.2b	1	Freeway Management	**Information Dissemination** (In-Vehicle Systems) **Lane Management** **Ramp Control** (Ramp Closures) **Special Event Trans. Management** **Surveillance** (Infrastructure)
OM-13.2c	1	Crash Prevention & Safety	**Animal Warning*** **Bicycle Warning** **Highway-Rail Crossing Warning*** **Pedestrian Safety****
OM-13.2d	1	Road Weather Management	**Information Dissemination** (Dynamic Message Signs) **Traffic Control Strategies**
OM-13.2e	1	Roadway Operations & Maintenance	**Asset Management** (Infrastructure Management) **Information Dissemination** (Internet/ Wireless/Phone)
OM-13.2f	1	Transit Management	**Information Dissemination**
OM-13.2g	1	Traffic Incident Management	**Surveillance & Detection** (Detectors, Imaging/Video)
OM-13.2h	1	Electronic Payment and Pricing	**Pricing** **Toll Collection**

Requirement	Points	Application Area	Functions (If Itemized, Shown Technologies ONLY)
OM-13.2i	1	Traveler Information	**En-Route Information** **Information Dissemination** **Pre-Trip Information** (511, Internet/ Wireless/Phone, Kiosks)
OM-13.2j	1	Information Management	**Data Archiving**
OM-13.2k	1	Commercial Vehicle Operations	**Safety Assurance** **Security Operations**
OM-13.2l	1	Intermodal Freight	**Freight-Highway Connector System**

* Earns points in rural applications only. Not considered "above and beyond" in an urban setting.
** Points are not earned for "Countdown" WALK/DON'T WALK signals; as they are not considered "above and beyond."

Requirement OM-13.3

2 points. Compliance with National ITS Architecture
Tailor the National ITS Architecture to create a "regional" ITS Architecture based on agency- specific needs. The regional ITS Architecture should consist of functions within ITS elements and architecture flows that interconnect each of the ITS elements in the region (and with ITS elements outside the region). For more information, visit FHWA's OST-R ITS Joint Program Office's ITS Standards Program website[2].

Requirement OM-13.4

2 points. Integrate M&O Strategies into Design
Integrate a system (such as design policies, procedures, and strategies) to ensure the needs of M&O strategies are fully considered in roadway infrastructure design. Consider M&O strategies during systems planning, project selection, and project design to maximize their potential and limit the need to retrofit roadways to meet M&O strategies. Retrofitting roadways is usually less cost effective and more likely to force the need for design exceptions than meeting the needs of M&O strategies during the design phase. For more information, visit the FHWA's Office of Operations' Designing for Transportation Management and Operations: A Primer website[3].

Requirement OM-13.5

2-3 points. Set Goals and Monitor Progress

Scoring is based on the following, cumulative requirements. The first requirements must be accomplished to earn the second.

- **Requirement OM-13.5a**

  2 points. Establish Safety and Mobility Performance Metrics

  Establish performance metrics specific to the operational system that is relevant to the implementation of ITS, including at least one metric related to safety, one related to mobility, and one related to integration of M&O strategies into design. Examples include travel times, incident response times, and incident frequency.

- **Requirement OM-13.5b**

  1 additional point. Monitor Progress and Demonstrate Sustainable Outcomes

  Monitor progress towards goals for at least one year after goal establishment using the performance measures established in OM-13.5a and show measurable advancement towards stated goals.

Resources

The following resources are referenced in this criterion and consolidated here:

1. FHWA Office of the Assistant Secretary for Research and Innovative Technology (OST-R) Intelligent Transportation Systems Joint Program Office Application Area Website, https://www.standards.its.dot.gov/LearnAboutStandards/ApplicationAreas
2. FHWA Office of the Assistant Secretary for Research and Innovative Technology (OST-R) Intelligent Transportation Systems Joint Program Office, ITS Standards Program Website, http://www.standards.its.dot.gov/LearnAboutStandards/NationalITSArchitecture
3. FHWA Office of Operations, *Designing for Transportation Management and Operations: A Primer*, http://ops.fhwa.dot.gov/publications/fhwahop13013/ch1.htm#s11

Scoring Sources

The program is considered to have met this criterion if the requirements above can be reasonably substantiated through the existence of one or more of the following documentation sources (or equal where not available):

1. Improvement plan with list of implementable strategies and technologies that are applicable to the system.
2. Well developed (mature) programs in place for signal timing and coordination, work zone coordination, and incident management.
3. Performance metric and report of where the greatest improvements can be made.
4. Plan and project selection documents showing early consideration of operation strategies and projects.
5. List of goals to be achieved and proof of progress toward these goals for the first year, as defined by the performance metric.