



## Supporting the Transition of ENTERPRISE ITS Warrants to a Permanent Home

### Project Summary

July 22, 2013

This project summary was prepared for the [ENTERPRISE Transportation Pooled Fund TPF-5\(231\)](#) program. With agencies from North America and Europe, the main purpose of ENTERPRISE is to use the pooled resources of its members, private sector partners and the United States federal government to develop, evaluate and deploy Intelligent Transportation Systems (ITS).

Bill Legg, Washington State Department of Transportation, was the ENTERPRISE Project Champion for this effort.

### Background

In 2010 ENTERPRISE developed initial warrants for nine Intelligent Transportation System (ITS) devices (Closed Circuit Television, Curve Warning Systems, Dynamic Message Signs, Dynamic Speed Display Signs, Highway Advisory Radio, Ramp Meters, Road Weather Information Systems, Variable Speed Limits, and ITS Devices in Work Zones). The warrants are available at: <http://enterprise.prog.org/itswarrants/>. These warrants were developed based on a need by the ENTERPRISE members for an efficient and effective methodology to determine if ITS deployments are appropriate, and to support any internal justifications needed to decide whether ITS technologies should be deployed. Simply put, members expressed a need to determine if the value that an ITS solution brings to a project warrants the costs of deployment and ongoing operation of the solution.

The [Manual on Uniform Traffic Control Devices \(MUTCD\)](#) defines eight (8) warrants for traffic control signals. These warrants allow State DOTs to investigate the need for a traffic control signal by completing an engineering study of the traffic conditions, pedestrian characteristics, and physical characteristics. The results of the engineering study are then compared against the traffic signal warrants as an initial analysis to determine whether installation of a traffic control signal is justified. Meeting the requirements of a warrant does not mandate that a traffic control signal be installed, but rather indicates that other factors and circumstances should be considered further to determine if a traffic signal control should be deployed.

The concept for the ITS Warrants was to build upon the ‘model’ of the MUTCD warrants and to investigate and develop warranted installation parameters to guide initial decisions for the deployment of ITS solutions. The project is not attempting to influence the MUTCD in any way. Rather, the warranted installation parameters developed for this project are another resource for DOTs to use in their consideration of ITS device deployments. The use of the ITS Warrants is intended to be voluntary, and entirely intended to serve those State DOTs that wish to use them in their ITS deployment decision making process.

Ideally, the ENTERPRISE Program envisioned that a National or International agency would embrace the concept of technology device warrants and carry the concept forward in order to support traffic engineers for years to come. In order to move towards this vision, ENTERPRISE approved this project “Supporting the Transition of ENTERPRISE ITS Warrants to a Permanent Home”. The objective of this project was to document activities ENTERPRISE had conducted as owner and maintainer of the warrants to assist in identifying potential organizations for transitioning the warrants to a new owner.

As ENTERPRISE documented the details of each task that was involved with owning the warrants, a number of options were suggested as potential organizations to transition the ownership and maintenance of the warrants. However after the ENTERPRISE Board reviewed the different options for one organization to maintain the warrants, it was agreed that ENTERPRISE should continue to own and maintain the warrants and partner with organizations to review the warrants. This approach was based on the understanding that it would be easier to find agencies willing to review and comment on one or more warrants periodically than it would be to find an organization willing to accept the entire workload of all the warrants. Given this, ENTERPRISE as part of this project developed a warrants review process to assist with review and modifications of the warrants.

This project summary includes details for ownership and maintenance of the warrants, the options considered for a new owner, the warrants review process, outreach conducted to partner with an organization to review the warrants and the next steps for the ENTERPRISE warrants efforts.

## **ITS Warrants Ownership and Maintenance**

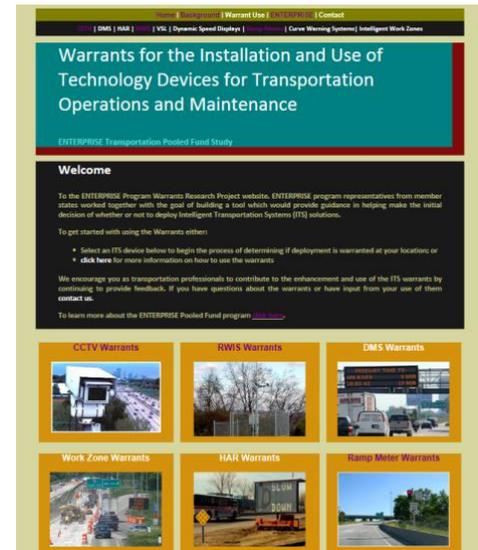
Since the completion of the initial ITS Warrants, the ENTERPRISE Program has owned and maintained the warrants. The activities that were performed, and that ENTERPRISE members believe need to be performed in the future to maintain the ITS Warrants, are defined below. The intent of defining these activities was to assist the ENTERPRISE members in determining the efforts and resources for continuing to own and maintain the warrants.

### **ITS Warrants Manual**

The ITS Warrants Manual is a Microsoft Word document that contains textual descriptions of the warrants for each of the ITS devices in one document. All assumptions, calculations, and sources used to determine the thresholds in the warrants are cited in this document. This document is updated as modifications are made to the warrants and as additional devices are added.

## ITS Warrants Website

An [ITS Warrants Website](#) was developed in 2009 and updated in 2012 as part of this project (“Supporting the Transition of ENTERPRISE ITS Warrants to a Permanent Home”) to provide an easily accessible online resource for any transportation professional to access and use the warrants. The website matches the information provided in the ITS Warrants Report. The website is updated as modifications are made to the warrants and as additional devices are added. The website is comprised of hypertext mark-up language (HTML) pages and as changes are needed simple modifications to the text of the HTML pages are required. The ITS Warrants website is currently hosted on the ENTERPRISE Program website. Basic knowledge of website design and development is all that is required to update the website content.



[enterprise.prog.org/itswarrants](http://enterprise.prog.org/itswarrants)

## ITS Warrants Review

To date, the ENTERPRISE Program has not followed a structured update and review cycle for the ITS Warrants. However, because the use of technologies does change, the recommendation made by ENTERPRISE was that each ITS Warrant be reviewed at least once every two years (or as necessary) to determine if any modifications to the thresholds are required, and to confirm if the ITS Warrant is still valid. Based on the recommendation for ENTERPRISE to continue to own and maintain the warrants, ENTERPRISE developed an ITS Warrants Review Process during this project to assist with review and modifications of the warrants. Following is an overview of the steps proposed for an organization to periodically review and offer feedback on the warrants.

- Step 1: Review the overall framework of the warrants, device definition and the purpose and content of each warrant
- Step 2: Provide modifications and comments from the review conducted in Step 1 to the ENTERPRISE Board
- Step 3: ENTERPRISE will update the ITS Warrants Manual and ITS Warrants Website

The review of the warrants also includes a literature review of the industry to determine if any published research or deployment evaluations have identified new findings that might alter the warrant thresholds.

It is anticipated that the ITS Warrants review process will be reviewed and modified as organizations provide feedback in order to enhance and streamline the process.

### **New ITS Warrants**

It has been recognized since the start of the development of the ITS Warrants that the warrants do not cover all ITS devices. In fact, as the ENTERPRISE Program has conducted projects related to different technologies, the group agreed to add additional ITS warrants (currently a warrant is under development for Intersection Conflict Warning Systems (ICWS)). The ITS Warrants Report provides a description of the process used to develop the warrants (Step 1: Definition of Purpose, Step 2: Identification of Critical Factors for Each Warrant, Step 3: Warrant Development, Step 4: Preliminary Testing and Warrant Adjustment). The ENTERPRISE Program continues to add to the warrants by adding additional devices as budgets allow. Warrants typically include less than five criteria to warrant a device deployment. Calculations are cited wherever possible to validate the criteria selected for the warrant. In addition, other agencies or groups may develop ITS Warrants. Therefore, the ITS Warrants should provide a mechanism for ITS Warrants to be proposed and developed by other agencies.

### **ITS Warrants Outreach**

ENTERPRISE continues to present the ITS Warrants efforts at applicable conference and meetings. Outreach is ongoing as the warrants continue to evolve. The overall intent is that transportation professionals benefit from the use of the ITS Warrants. Until a 'critical mass' is reached and the ITS Warrants are recognized as a resource and known throughout the ITS community, this outreach is recommended. A [one page project summary](#) of the warrants efforts was developed to assist with outreach of the ITS Warrants Review Process. The summary details the devices that ENTERPRISE has developed and tested, identifies the purpose of the warrants, indicates how the warrants are used, and summarizes the warrants review process. The warrants one page summary includes information that matches the ITS Warrants Report and ITS Warrants Website.

## **ITS Warrants Permanent Home Options and Recommendations**

After review of the efforts and resources described above to own and maintain the warrants the ENTERPRISE Board identified options for a permanent home for the warrants. ENTERPRISE members have done considerable outreach to the transportation community to educate transportation professionals about the ITS Warrants and several groups expressed interest in the ITS Warrants including ITS Canada, ITS America and the Transportation Research Board (TRB). The options ENTERPRISE considered included ENTERPRISE continuing to own and maintaining the warrants as well as transitioning the warrants to national ITS organizations (e.g. ITS Canada, ITS America, AASHTO).

After a detailed review of the options, the ENTERPRISE Board agreed ENTERPRISE should continue to own and maintain the warrants and partner with organizations to review the warrants. This approach was based on the understanding that it would be easier to find agencies willing to review and comment on one or more warrants periodically than it will be to find an organization willing to accept the entire workload of all the warrants. It is anticipated that as organizations are involved with the review process that that the ownership of the ITS Warrants may in the future be transitioned to a national organization.

## ITS Warrants Review Outreach

Potential review organizations were suggested to review the ITS Warrants. Organizations included the AASHTO Standing Committee on Highway (SCOH), AASHTO Subcommittee on Systems Operation and Management (SSOM), AASHTO Subcommittee on Traffic Engineering (SCOTE), AASHTO Subcommittee on Maintenance (SCOM), National Committee on Uniform Traffic Control Devices (NCUTCD), FHWA Pooled Fund Studies, ITS America, and ITS Canada. It is recognized that this list may not be complete and as the warrants are reviewed additional organizations may be added or removed.

During the April 2013 ENTERPRISE Board Meeting the members reviewed the potential organizations and suggested specific warrants for each organization to review. It was determined to move forward with contacting SCOTE to engage this group in review of the ITS warrants. Meetings were coordinated with the Minnesota DOT Deputy Commissioner who chairs AASHTO SCOTE to request an agenda item at their June 2013 meeting.

SCOTE discussed ENTERPRISE's request to review the ITS Warrants during their June 2013 meeting and approved the resolution on the following page to participate in review of the warrants. The approval indicates that AASHTO SCOTE agreed to create a task force to review and provide comments to the ITS Warrants as well as advise ENTERPRISE of other AASHTO subcommittees that would be appropriate to participate in review of some of the warrants.

***Motion for AASHTO Subcommittee on Traffic Engineering to Review ITS Warrants  
Developed by the ENTERPRISE Pooled Fund Study***

***June 26, 2013***

*WHEREAS, AASHTO SCOTE is a member of the National Committee on Uniform Traffic Control Devices (NCUTCD) which assists in the development of standards, guides and warrants for traffic control devices and practices, and makes recommendations to the Federal Highway Administration (FHWA) for the Manual on Uniform Traffic Control Devices (MUTCD); and,*

*WHEREAS, Intelligent Transportation System (ITS) Devices have been deployed for over 20 years with no specific guidance on justifying ITS deployments.*

*WHEREAS, the ENTERPRISE Transportation Pooled Fund TPF-5(231) has sponsored a project to develop Intelligent Transportation Systems (ITS) Warrants and published "Warrants for the Installation and Use of Technology Devices to Assist Transportation Operations, Traffic Management Information Dissemination", dated May, 2010, as documentation of a method to determine where ITS device deployments are appropriate and validate existing ITS deployments of Closed Circuit Television, Road Weather Information Systems, Dynamic Message Signs, Work Zones, Highway Advisory Radio, Ramp Meter, Curve Warning System, Variable Speed Limit, and Dynamic Speed Display; Intersection Conflict Warning Systems; and,*

*WHEREAS, the ENTERPRISE project recommended that additional review and feedback is needed to continue to enhance the ITS warrants.*

*THEREFORE BE IT RESOLVED, by AASHTO SCOTE;*

*THAT, AASHTO SCOTE review the ITS Warrants developed by the ENTERPRISE Pooled Fund, and provide comment so modifications can be made to the warrants so they will best assist transportation professionals in their decision to use the ITS tools identified above. SCOTE may advise ENTERPRISE that the review of some warrants should be done by other AASHTO subcommittees.*

### **ITS Warrants Next Steps**

ENTERPRISE will continue to work with SCOTE on the review process to update the warrants. And based on review and input, ENTERPRISE will also work with SCOTE to decide next steps. It is anticipated that as organizations are involved with the review process that the ownership of the ITS Warrants may in the future be transitioned to a national organization. ENTERPRISE will also continue to add device warrants. Currently ENTERPRISE is developing warrants for Intersection Conflict Warning Systems that is anticipated to be completed by the fall of 2013.