

New ITS and Traffic Signal Device Product Review Guidelines

Michigan Department of Transportation

FINAL

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A - MANUFACTURER CHECKLIST

1. Introduction

The Michigan Department of Transportation (MDOT) strives to provide a state-of-the-art transportation network using safe, effective, and reliable technology in its traffic signals across the state. As the technologies used in traffic signal and Intelligent Transportation Systems (ITS) devices continue to evolve and advance at an increased rate of change, guidance to ensure consistent MDOT reviews and approvals of these devices is necessary.

The purpose of these guidelines is to present MDOT's formal review and evaluation process for new traffic signal and ITS devices, products and software, including testing and certification guidance.

To initiate an evaluation, please fill out and submit form 1022N (<u>1022N Link</u>) after carefully reading through the guidelines. The guidelines identify four separate tiers of technology that a device or software may be categorized as by MDOT's ITS New Products Subcommittee (NPS). Each tier has its own unique evaluation process. Once the 1022N form is received by the NPS, the NPS will identify the evaluation process or tier number. The four tiers of devices/software and evaluation processes are below.

- Tier 1 Critical Traffic Signal Devices which are maintained by MDOT or Local Agency staff (See Section 2)
- Tier 2 Supplemental Signal and Miscellaneous Devices which are maintained by MDOT or Local Agency (See Section 3)
- Tier 3 Software only applications (See Section 4)
- Tier 4 ITS devices that are maintained by ITS contractor(s) (See Section 5)

Please note that these evaluation processes are from a technical standpoint with staff that have a background in ITS and traffic signal technology. Some devices that include a software/cybersecurity component or a subscription fee may need additional evaluation by others independently of this process and there are no guarantees that approval through this process will equate to acceptance by the State of Michigan. Lastly, payment will not be given for materials or services that a vendor provides as part of this evaluation process as all materials will be returned to the vendor.

<u>Tier 1 – Critical Traffic Signal Devices</u>

Any electronic devices identified below that are maintained by MDOT Region Electricians/Contract Local Agencies and is an asset in the Signals Unit's Asset Management System (SigAMS) must go through this process if it has not already been approved. Tier 1 is equipment that directly impacts the operations and/or safety of the traffic signals.

- Traffic Signal Cabinets, including various ancillary devices included with the cabinet
- Traffic Signal Controller units including both hardware and firmware
- Malfunction Monitoring Units
- Vehicle and Pedestrian (including Accessible) Detection Systems
- Emergency/Transit Preemption Systems
- Cellular Modems
- Spread Spectrum Radios
- Switches
- Battery Back-up/UPS and Power Conditioning Systems
- New Technology that is critical to the operations of the traffic signal

IMPORTANT NOTE: For Tier 1 Critical Devices, please begin with Section 2 of the guidance below. All the steps in Section 2 are applicable for Tier 1 Critical Devices. Please note that this process is not designed to fit within the timeframe of a signal or road project's design phase as indicated in Section 2.10. Vendors must submit their products before the anticipation of it being used on a specific project.

Tier 2 – Supplemental Signal and Miscellaneous Devices

Tier 2 is equipment that does not affect the operations and/or safety of a traffic signal. The device is usually maintained by MDOT or Local Agency staff and is categorized as an asset in the SigAMS. A more streamline approach is identified in Section 3 for tier 2 technology. Below are some examples of tier 2 devices:

- Rural Intersection Warning Devices
- Curve Warning Systems
- LED Border Signs
- Flasher Cabinets
- Signal Heads and Shields
- Solar Powered Devices
- Battery Operated Devices
- Miscellaneous hardware and electronic components
- New Technology that is supplemental in nature and does not control traffic

IMPORTANT NOTE: For Tier 2 Supplemental Devices, please begin at Section 3 of the guidance below. The evaluation of Tier 2 equipment is streamlined when compared to its counterpart process for Tier 1 devices. The main difference between Tier 1 and Tier 2 is that a Pilot of one year is not required for Tier 2. The timeframe required to evaluate a Tier 2 device may fit within a schedule of a project's design phase if properly planned. The intent of Section 3 is to provide direction for MDOT Project Managers to help ensure that their project's schedule can include this process when scoping any Tier 2 Supplemental Devices. Vendors may refer to Section 3 for general guidance of the evaluation process.

Tier 3 – Software Only Applications

Tier 3 applies to both traffic signal and ITS software where a primary device or hardware is not included. An example would be an adaptive traffic signal system or data analytics. Please refer to Section 4 for more information on the evaluation process.

Tier 4 – ITS Devices

Tier 4 applies to most ITS electronic equipment that is specified on ITS projects and are maintained by the ITS contractor(s). Examples are included below.

- ITS communications devices
- Traffic monitoring devices
- Surveillance systems
- Message signs
- Enhanced video encoders
- Cabinets and miscellaneous cabinet components

2. Tier 1 Critical Traffic Signal Device Review Process

2.1 Overview

The traffic signal device review is composed of a five-step process, where at the end of each step, MDOT decides if the device/product is suitable to proceed to the next step. The process is as follows:

- 1. Determination to Evaluate
- 2. Technical Documentation Evaluation
- 3. Technical Shop Evaluation
- 4. Pilot Field Test
- 5. Final Determination

The evaluation processes are generally built around MDOT's current *Standard Specifications for Construction and Previously Approved Special Provisions* for that device/product type. Where there is a discrepancy with the testing criteria, the most current *Standard Specifications for Construction and Previously Approved Special Provisions* for that device/product type will be the minimum requirement. Exceeding the minimum requirement may be considered beneficial to MDOT and can be factored into the review process. In addition, some of the evaluation items are intended to provide MDOT an opportunity to assess the overall capabilities of the device technology and if the new device has capabilities beyond currently approved

devices. Some of these inquiries and beyond tests may go the requirements of the special provisions and the MDOT Standard Specifications for Construction and Previously Approved Special Provisions. These inquiries and tests will generally provide an opportunity to demonstrate capabilities beyond the minimum requirements which may be beneficial to MDOT.

Figure 1 illustrates an overview of the process workflow. The remainder of this chapter provides additional details for each of the five steps of the New Device Review Process, including communication and scheduling protocol, and key considerations for vendors.



*A fatal flaw is defined as a failure of supplying literature that shows the product meets requirements, failure of subsequent testing of mandatory functionality, performance issues, and/or an equipment failure during testing/piloting.

FIGURE 1: NEW TRAFFIC SIGNAL DEVICE REVIEW PROCESS OVERVIEW

2.2 Step 1 - Determination to Evaluate

The **Determination to Evaluate** is a preliminary non-technical review by MDOT's ITS New Products Subcommittee (NPS) to determine if MDOT has justification to utilize the proposed device/product and would like to evaluate.

This step is typically initiated by a device vendor/manufacturer contacting the MDOT Lansing Signals Unit (LSU) to request their device be reviewed. The requests may reach MDOT's attention via different sources:

- Direct request to the LSU
- Request to a Region or TSC office which is then brought to the LSU
- Request to a local agency (often an MDOT maintaining agency) which is then brought to the LSU

To initiate a new product evaluation, the vendor must fill out and submit form 1022N (<u>1022N Link</u>). MDOT will review the form. If the product is classified as technology that is included in these guidelines, then the vendor will be provided the "Manufacturer Checklist" with a request for information (RFI) form specific to the device category for the vendor to fill out and send back to the LSU (see Appendix A). The vendor provided information is then brought to the NPS to determine if the device warrants further review and testing. The NPS will look at the product's information and identify the following:

- Does the device fall under an existing Special Provision?
- Does the device meet the technical requirements in the existing Special Provision?
- Does the device exceed existing technical requirements in a Special Provision and is this added functionality useful to MDOT?
- How many devices already meet the existing Special Provision or category of technology?
- How many devices are currently being evaluated by the NPS?

In most cases, MDOT has the resources to support up to two devices for a single category of technology (i.e., signal controller). Some devices may be sole source such as Malfunction Monitoring Units (MMU) that are safety critical to the operations of the intersection or present interoperability challenges that are overly burdensome to manage. If MDOT already meets the specified number of devices per technology, they can elect to not move forward with the evaluation of the product. The table below defines the number of products MDOT can support for the technology that MDOT has developed technical evaluation documentation for to date. Justification is provided to explain why there is a limited number of products that MDOT can support. In total, with this technology alone, MDOT's approach would allow up to **30 different products**. This table will be updated as MDOT further evaluates other devices. In general, those other products will likely be limited to two products per technology as well. A list of the previously approved products on MDOT-let signal contracts or products that successfully went through the new products evaluation process can be provided upon request.

Technology	Max. Number of Products	Justification
Signal Cabinets	Two Products	Two products are expected to cover all installations statewide. Limiting the number of options streamlines maintenance in the case of troubleshooting an issue on the street that is affecting the operations of the traffic signal.

Technology	Max. Number of Products	Justification	
Signal Controllers	Two Products	Training and interoperability challenges consist in the Signal Industry with signal controllers. The current central signal system is only compatible with the two existing controllers used by MDOT. Maintaining this interoperability will remain an ongoing challenge as controller firmware and the central software system is routinely updated. Limiting the number of options also streamlines maintenance in the case of troubleshooting an issue on the street that is affecting the operations of the traffic signal.	
Vehicle Detection Systems	Two Products for each sub- category of vehicle detection (i.e., radar vs camera)	MDOT has at least seven different sub-categories of vehicle detection technology which provides ample opportunity for innovation and competition with up to 14 potential devices in use. Many of these devices require substantial training and have a software application which provides additional resource needs for MDOT to properly maintain.	
Malfunction Monitoring Units	One Product	Interoperability challenges may exist with other devices. As this device acts as the failsafe to ensure that the signal goes into flash when other equipment fails, it is paramount for the motoring public's safety that this device is properly installed and configured. MDOT has the resources to support only one of these devices.	
Cellular Modems	Two Products	Interoperability challenges exist with the State of Michigan private network, the central signal system, signal controllers, and cell modems. By supporting two cell modem products, MDOT can effectively manage these challenges to ensure remote communications are functioning properly while supporting competition.	

Technology	Max. Number of Products	Justification
Radios	One Product	MDOT typically installs radios in an existing radio system which requires synchronization with existing radios in the traffic signal system. In addition, MDOT is not installing as many radios so there is not a real need for MDOT to invest resources in this technology as it is mostly being replaced by cellular communications.
Switches	Two Products	As noted, communications equipment can present interoperability challenges with the enterprise private cell network supporting central signal system. By allowing two products, MDOT already must address the challenges of having five different products operating together in different arrangements (two cell modems, two switches, one radio) on a local level plus the State of Michigan Network and the central signal system.
Preemption Devices	Two Products	Preemption devices are installed per the request of the local agency and is the responsibility of the local agency to pay for installation and maintenance, however, MDOT is required to be trained and knowledgeable with the devices. Two products allow for a reasonable choice for local agencies to select from while also helping manage the resource obligations of MDOT for a product that is optional.
Solar Powered Devices	Two Products for each sub- category of Solar Powered Devices	Having more than two products adds extra burden and cost for MDOT's maintenance staff to maintain stock. These devices typically require specific parts and pieces for the specific product and are not generic.
Battery Operated Devices	Two Products for each sub- category of Battery-Operated Devices.	Having more than two products adds extra burden and cost for MDOT's maintenance staff to maintain stock. These devices typically require specific parts and pieces for the specific product and are not generic.

TABLE 1 – TECHNOLOGY AND MAXIMUM NUMBER OF PRODUCTS JUSTIFICATION

In addition, **MDOT only has the resources to evaluate up to four products simultaneously of existing technology** otherwise the NPS will not be able to consistently perform the evaluation process. If MDOT exceeds this threshold, a product request will be placed on a waiting list to be evaluated in the future once ongoing evaluation(s) are completed. Prioritization will be based on first come first serve and the waiting list will be provided to external stakeholders upon request.

At MDOT's discretion, MDOT may elect to evaluate more than four products simultaneously if MDOT has a need for a product's technology that is new to MDOT.

A formal response letter from the NPS is provided to the vendor indicating next steps.

If the device is approved for evaluation, an MDOT Process Manager is assigned in the LSU to facilitate the review process and serve as the primary MDOT point of contact with the vendor. The assigned Process Manager is communicated in the formal response letter along with an overview of the review process.

The general workflow of this step is illustrated in Figure 2.



FIGURE 2: DETERMINATION TO EVALUATE WORKFLOW

2.3 Step 2 - Technical Documentation Evaluation

The **Technical Documentation Evaluation** is a preliminary evaluation of the product information provided by the vendor to confirm that there are no obvious insurmountable issues that would preclude approval of the use of the device/product by MDOT. This step is only performed IF the device is approved for evaluation in the previous step.

The MDOT Process Manager will assign appropriate staff for this documentation review based on the device type and communicate the review schedule to the team as outlined in the formal MDOT response letter prepared in Step 1.

The *Technical Document Evaluation* tab of the specific device type review spreadsheet will be used by the MDOT review team as a prompt list for the review and for documentation of how a device does or does not meet review criteria or standard based on the technical documentation provided by the vendor. The electronic versions of the spreadsheets are maintained and available upon request.

To improve the technology and products that MDOT uses, some response requests are intended to verify if the product exceeds MDOT's current specifications and provides additional functionality or durability. For example, if a battery-operated device is specified to have a 5yr minimum lifespan, a product warranted to have a 10yr minimum lifespan will be reflected positively in determining which devices to approve.

Once the team has completed their review of the technical documentation, the MDOT Process Manager provides a formal response letter to the vendor. The response will have one of the three following review status indications:

- Approved for Shop Test
- Additional Information Needed

• Not Approved

If additional information is needed, the response letter will indicate what information is needed and the technical document review continued when the vendor has responded with the additional information.

If the technical documentation review indicates the device should not be approved, the response letter will indicate MDOT's reason(s) for not approving the device to advance in the review process at this time.

The general workflow of this step is illustrated in Figure 3.



FIGURE 3: TECHNICAL DOCUMENTATION EVALUATION WORKFLOW

2.4 Step 3 - Technical Shop Evaluation

In the **Technical Shop Evaluation**, the MDOT Process Manager will coordinate with the review team to conduct a bench test at MDOT's Lansing Signals Shop utilizing sample devices/products provided by the vendor. The device/product will be tested in MDOT standard traffic signal cabinets to verify and evaluate the information provided in the Technical Documentation Evaluation and if the operations are suitable to MDOT's needs. This step is only performed IF the vendor was approved for a shop test in the previous step.

The vendor will need to be present on-site to witness MDOT's device setup and configuration for the bench test. The vendor may need to provide a qualified signal technician or electrician to assist with the testing. The *Shop Test Evaluation* tab of the specific device type review spreadsheet will be used by the MDOT review team as a prompt list for the shop test and for documentation of how a device does or does not meet testing and certification criteria. The electronic versions of the spreadsheets are maintained and available through the LSU.

To improve the technology and products that MDOT uses, some test cases may be optional and are intended to test the equipment to determine if the product exceeds MDOT's current specifications. For example, MDOT may test the product's compatibility, which is not a current requirement in the specifications, with other equipment or applications. Optional test or criteria will be clearly defined upfront prior to testing. In the event MDOT choses to limit the number of devices, doing well on these tests will reflect positively in determining which devices to approve.

Once the team has completed the shop test evaluation, the MDOT Process Manager provides a formal response letter to the vendor, The response will have one of the three following review status indications:

• Approved for Field Test

- Additional Information Needed
- Not Approved

If additional information is needed, the response letter will indicate what information is needed and the shop test evaluation continued when the vendor has responded with the additional information.

If the shop test evaluation indicates the device should not be approved, the response letter will indicate MDOT's reason(s) for not approving the device to advance in the review process at this time.

The general workflow of this step is illustrated in Figure 4.



FIGURE 4: SHOP TEST EVALUATION WORKFLOW

2.5 Step 4 - Field Test Evaluation

The MDOT Process Manager will coordinate with the vendor to conduct a **Field Test Evaluation** (commonly referred to as a Pilot Test) of the device/product at a small number of locations to evaluate the system in real world field conditions over an extended period. This step is only performed IF the vendor was approved for a field test evaluation in the previous step.

The MDOT Process Manager will identify the size and location of the field installation, and the vendor will then provide the devices to MDOT for field installation. MDOT will require that the vendor be present in the field to witness field installation and configuration. In addition, MDOT may require a prequalified contractor provided by the vendor to assist with the installation. The devices will remain in the field and monitored by MDOT for a duration of time defined by the MDOT Process Manager. This may take up to a year if the device requires performance verification in all seasons of Michigan weather. Devices will be removed by MDOT or the vendor's contractor after the pilot field test is complete, and a summary of the entire device review and key findings will be provided by the MDOT Process Manager to the NPS.

There will typically not be a separate Field Test Evaluation response provided to the vendor. The NPS (in Step 5) will provide the final determination if the device is approved or not.

The general workflow of this step is illustrated in Figure 5.



FIGURE 5: PILOT FIELD TEST EVALUATION WORKFLOW

2.6 Step 5 - Final Determination

Based on the results of the above steps, MDOT's New Products ITS Subcommittee will make a **Final Determination** on whether the device/product is approved for use on MDOT's roadway network.

Once the NPS has decided, the MDOT Process Manager provides a formal response letter to the vendor. The response will have one of the three following review status indications:

- Approved
- Additional Information Needed
- Not Approved

If additional information is needed, the response letter will indicate what information is needed and the final determination response letter updated when the vendor has responded with the additional information.

If the NPS indicates the device should not be approved, the response letter will indicate MDOT's reason(s) for not approving the device at this time.

If the device is approved, the response will indicate which pay item the device is approved for use under or if there are any other special considerations.

The general workflow of this step is illustrated in Figure 6.



FIGURE 6: FINAL DETERMINATION WORKFLOW

2.7 Communication

Once the NPS has approved a device for review, an MDOT Process Manager will be assigned as MDOT's primary point of contact for coordination as noted in Section 2.2. The MDOT Process Manager will be responsible for coordinating MDOT's review staff, coordination with the vendor, and act as the liaison to the NPS regarding the review findings. All vendor communication with MDOT will be through the MDOT Process Manager.

All communications must include the MDOT Process Manager and vendor primary and backup contacts. During the evaluation process, work teams may be developed to facilitate technical processes. Contact without copying the MDOT Process Manager and vendor primary and backup contacts is strongly discouraged, and such communications may be considered as non-responsive. If contact from MDOT is received without the MDOT Process Manager copied, the vendor should contact the MDOT Process Manager to confirm the status of the contact.

Vendor technical experts will likely be required to be available either via email, phone or in person at times during the evaluation process. MDOT Requests for Information (RFIs) should be responded to by the vendor as soon as possible. Responses that exceed more than 10 business days without contact to update MDOT on the nature of the delay may classify the vendor as non-responsive and reason for MDOT to end the evaluation.

2.8 Scheduling

The MDOT Process Manager will coordinate with the vendor to develop an estimated schedule for the device/product evaluation process. It is important to note that the MDOT technical experts have other duties related to maintenance and supporting construction projects. This may result in limited MDOT staff resources available for review and testing. Their work supporting these other duties takes precedence over the testing of new devices. Furthermore, as MDOT does not have independent staff dedicated to the device review process, MDOT reserves the right to prioritize staff workloads as they relate to reviewing new devices. MDOT may place an evaluation on a waiting list as noted in Section 2.2.

The expected duration of each review step is provided in the table below and should be used as a template for coordinating schedules between MDOT and vendors.

Evaluation	Duration	Comments
Evaluating		The Technical Documentation Evaluation is dependent upon
Technical	2 to 4 weeks	receiving all required information in a usable format and in a
Documents		timely manner.
Bench Testing Equipment	4 to 6 weeks	Bench Testing is dependent upon receiving all required equipment from the vendor at the signal shop designated for testing following a successful technical document review.
Field Testing Equipment	Up to 1 year	Field Testing Equipment is dependent upon a successful bench test at the signal shop before implementing in the field. This duration is necessary to assess equipment performance over the course of a typical year which involves significantly variable conditions between seasons.

TABLE 2 – EXPECTED EVALUATION DURATIONS

2.9 Device Upgrades or Issues

Device approval is based on the make and model tested including software & firmware at the time of the review. In other words, the approval is for that physical device/software/firmware combination at that snapshot in time. If there are any

subsequent changes over time including software or firmware changes, the vendor must notify MDOT prior to providing these devices on MDOT Contracts. MDOT will determine if the change is substantial enough to justify a complete review per the established process or if an abbreviated review is sufficient. Failure to notify MDOT may result in rejection of the device on MDOT projects.

In addition, devices currently approved for use on MDOT projects may be reviewed again if MDOT staff find concerns with the operation, performance, or functionality of the devices/products provided on projects. The vendor is expected to participate in the review process, which will follow a similar process to the new device/product review. Refusal to participate may result in rejection of the devices on new projects by removal of the brand name on the Special Provision. If upon review, they are found to no longer meet the requirements, MDOT will notify the vendor of the status and the key issues that led to the change.

As technology and operational needs change, MDOT may implement new standards and specifications for device type. MDOT will notify vendors in advance of the change to provide an opportunity to confirm if their devices/products can meet the new requirements by a date to be determined (typically 6 to 12 months). Depending on the nature of the changes to the specifications, an abbreviated MDOT review process may be used that focuses primarily on the new requirements at the discretion of the MDOT Process Manager.

2.10 Vendor Considerations

The following are key considerations for vendors regarding MDOT's New Device Review Process:

- 1. Approval of the device/product does not imply or guarantee any intention by MDOT that it will utilize your device/product.
- 2. MDOT reserves the right to determine when and where a device/product is utilized. Some device/product types are only used rarely.
 - A. Determination of when and where to use such devices is outside the scope of this process. This evaluation is limited to determining if the proposed device/product is suitable where MDOT determines implementation is appropriate.
 - B. Some devices/products are only installed at a Local Agency's request. MDOT maintains the right to approve or deny the use of the device/product on MDOT roadways and may set limits on how it is utilized.
 - C. After successful completion of the evaluation process, MDOT may decide to deploy a product gradually so additional testing and verification of the product's durability, compatibility, and longevity can be completed. A "Pilot" Special Provision will be utilized for procurement of the product until validation can be completed to add it to a standard Special Provision. MDOT will utilize this Special Provision for up to one year.
- 3. For devices/products that require significant knowledge and training, MDOT may limit the number of approved devices/products to limit the training burden on MDOT staff.
- 4. For devices/products that have limits on compatibility with other brands, MDOT may limit the number of approved devices/products to limit issues with compatibility and spare parts.
- 5. Devices/products should generally be consistent with MDOT's current Standard Specifications for Construction and Previously Approved Special Provisions for that device/product type. MDOT will be updating many of its Special Provisions in 2022 to list brand names that are currently approved for use along with the technical requirements. If applicable, an "approved equal" option will be noted in the Special Provision with the requirement for the

"approved equal" product to go through this evaluation process. The evaluation process will not be justification to delay the project.

- 6. A device/product that has been rejected may not be resubmitted for a minimum of 24 months from the date of the rejection letter or 12 months if only minor issues were discovered during the previous review.
 - A. If the product was rejected previously, any new submittal must include details of the updates and how they address the technical issues found during the prior review and testing.
- 7. It is important that the vendor provided technical documentation be complete and well organized. The response to the items in the Technical Documentation Evaluation spreadsheets must directly respond to each item requested. Failure to provide a complete and organized response may result in evaluation delays or rejection of your device/product.
 - A. While website links, technical details and marketing materials can be included, they should be referenced in the vendor's PDF response to the specific MDOT questions with page numbers or appendix references called out in the response.
 - B. MDOT may request clarification or have additional questions based on the Technical Documentation Evaluation.
 - C. If a question does not apply to your product, include a statement of why it does not apply. A blank response may be considered non-responsive and could result in rejection of your device/product

3. Tier 2 Supplemental Device Review Process

The intent of this section is to provide guidance for MDOT Project Managers and any MDOT staff who procures Tier 2 supplemental electronic equipment as defined in Section 1 above. Please note the following:

- The evaluation process applies to any Tier 2 devices that are maintained by MDOT staff and/or identified as an asset in the Signals Unit's Asset Management System (SigAMS)
- If the device is categorized as Tier 1 then this process below does not apply, and the Tier 1 device shall not be purchased or included on a project until after it has been evaluated under the guidelines in Section 2.
- This process does not cover the use case of the product or the specific need for it at a location. This process is to evaluate the hardware of the Tier 2 device from a technical and operations standpoint.
- <u>This process is expected to take up to 16 weeks, so it is very critical that submittals are made at the earliest</u> <u>time possible, ideally during project scoping.</u>
- The New Products ITS Subcommittee is not responsible for the drafting of any Special Provisions or Contract Documents that may result from this evaluation.

The steps below outline the process for MDOT staff to follow in most circumstances. Please refer to the flowchart for a quick overview of the process and the disclaimers at the end of this section are for clarification on unique cases that may not be completely covered in Steps 1 - 5.

Step 1: During the scoping of the project, the Project Manager should e-mail the Region's Statewide Signal Operations Engineer, the Region Electrician, and the Signals Unit New Products Evaluator with a request for a layout request which will be needed to add the device to SigAMS. The Project Manager should include the details as defined below:

- The Project SERF Form
- Device Type Make(s) and Model(s)
- Cutsheets
- (Yes/No) Existing Special Provision
 - Identify the Special Provision if one exists
 - Alternative Device Type if new Special Provision is needed (i.e. LED Border Sign preferred but 12" flasher above sign would be acceptable alternative)
 - Consultant or Engineer responsible for project Special Provision development
- Location(s)
- Project Job Number and Plan Completion Date



The Process for the Evaluation of Supplemental

Electronic Device Hardware that is Maintained by MDOT

Region Electrician and Identified as an Asset in SigAMS

Step 2: The Signals Unit will review the device information and decide on whether the device will need to be evaluated using the steps in the flow chart as well as consulting Section 2.2 of this guidance. It is important to note that even if an existing Special Provision may exist from another project, it does not mean that the device does not to be evaluated.

Step 3: Notification by the Signals Unit will be made to the Project Manager on whether the device needs to be evaluated. If the evaluation of the device is not required, the process stops here. However, if the device needs to be evaluated then continue onto step 4.

Step 4: An evaluation is required. The Signals Unit will develop a team made up of the Region Electrician, ITS Engineer (if necessary), Signal Operations and Design staff, and a member of the Project Team. Sections 2.3 and 2.4 will be utilized to evaluate the device.

- *i.* Technical Documentation Evaluation
- *ii.* Technical Shop Evaluation (Shop Testing)

Step 5: Report results of evaluation to Project Manager, Maintainer, and ITSPO Manager.

- Device Approved: The device can be added to an existing Special Provision, or the Project Team can draft a Special Provision with the device called out by the name of the manufacturer and model. The drafting or modification of any Special Provision is to be done by the Project and not the evaluation team. Section 2.10.5 of this guidance should be referred to and an example of the language in the Special Provision that could be used will be shared by the Signals Unit.
- ii. **Device Not Approved:** The device cannot be added to the project. An alternative that has previously been approved by the Signals Unit can be selected instead or if there is time an alternative new device can undergo evaluation.

Disclaimers -

- The evaluation process should take 8 to 16 weeks to complete but this timeframe is dependent both on MDOT and vendor resources and responsiveness. Please be aware of this for your specific project schedule.
- A list of previously used and/or vetted devices shall be maintained by the Signals Unit and shared with the Regions upon request.
- Multiple devices instead of just one device may be submitted and evaluated by the team if the Project Manager determines it necessary to provide a competitive specification and sole sourcing a device is not justifiable.
- If procurement is not through a Let project, then the device still needs to be evaluated if it is Tier 2. The only
 difference is that a Special Provision may not exist and the drafting of one if approved by the New Products ITS
 Subcommittee will not be required.
- Payment for materials or services will not be provided to vendors as part of the evaluation. All materials will be returned to the vendor after testing is completed.

4. Tier 3 Software Only Review Process

This section refers only to software solutions that do not include a hardware component. This is a standalone section within this guidance.

Vendors often express a desire to have the ITS Program Office review software. The New Products ITS Subcommittee can review software applications but there are many limitations to the review process which include:

- The software may not be able to be installed on State of Michigan (SOM) devices due to security concerns and system support constraints. The Department of Technology, Management, and Budget supports MDOT's computer devices and software and in most cases does not have staff or resources to pilot software.
- 2. MDOT data may not be shared unless a Data Sharing Agreement is executed with the vendor which is unlikely to occur due to length in time it takes to execute such an agreement and current workload for staff that processes those agreements with existing vendors that are under direct contract with MDOT.
- MDOT staff time and resources are limited in evaluation of software. Often, vendors will want to update software repeatedly to address MDOT comments which can turn into a long arduous process for MDOT staff with little to no benefit guaranteed for MDOT.
- 4. MDOT cannot directly purchase the software unless it competitively awarded through an RFP so all evaluations must be at no cost to MDOT.

With that said, the ITS Program Office and vendors can both benefit and likely gain a lot of information from a streamline evaluation process of the software. The evaluation process would consist of the following steps:

- 1. The vendor can submit a request via the 1022N Form <u>1022N Link</u> which will initiate a response from MDOT.
 - a. Vendor must provide a specific use case recommendation, overly broad e.g. "improve traffic operations" or indeterminate e.g. "to be determined after demo" uses will be rejected.
- 2. MDOT will determine based on information provided on the 1022N form and any product information sheets if a demonstration is necessary. Reasons not to proceed with a demonstration may include lack of information, lack of software development, the need for MDOT data, and/or lack of practical need or future use by MDOT.
- 3. If MDOT proceeds to evaluate the software, a demonstration would be completed by the vendor. After the demonstration, MDOT will make the determination if further evaluation of the software is necessary. MDOT may decline proceeding onto the next steps for a variety of reasons:
 - a. MDOT has a similar software already under contract and can provide the vendor with feedback on the timeframe on when a new RFP may be advertised in the future.
 - b. MDOT discovers that it does not have a current need for the software or future use for it.
- 4. After the demonstration, MDOT may elect to pilot the software if it is possible. The vendor will develop a pilot plan in which they will identify the goals (ideally measurable) of the pilot, the resources required, and how it will be executed considering the limitations noted above. Pilots may not be longer than three months in duration and shall not require a significant amount of MDOT time or resources. MDOT will determine after the plan is submitted whether to proceed with the pilot.
- 5. After the pilot is completed, MDOT will return any materials back to the vendor. Feedback will be provided back to the vendor by MDOT in the form of an e-mail.

MDOT will provide justification and feedback for any decisions made as part of the evaluation process including overall feedback on the software. Even if the pilot is very successful, MDOT does not have the capability to directly purchase

software without going through a formal competitive bid process, typically in the form of an RFP. A successful pilot may plant the seed for research ideas which are more formal and in depth or other contract mechanisms. There is no guarantee though that MDOT will ever pursue these options due to several factors including budget, resources, and other priorities.

5. Tier 4 ITS Device Review Process

This section pertains to common electronic ITS device hardware that is procured via ITS Projects and is maintained by the ITS Contractor(s). The vendor will submit form 1022N (1022N Link) to initiate the process which will be reviewed by the NPS. MDOT will evaluate the device using the following steps:

- 1. New product submittal is received by the NPS.
- 2. New product is forwarded to subject matter experts for specification review.
 - a. **Specification Review:** Submitted product will be reviewed against current MDOT Specifications to determine if the product falls under an existing specification. A letter outlining the project product submittal process and applicable specifications will be provided to the vendor.
- 3. If there is not a current specification for the submitted product, the product will be evaluated by the NPS for current or future operational or architectural needs.
- 4. Operational and Architectural Review: ITS project user needs, and hardware specifications are developed and refined based on stakeholder input during the systems engineering phase of a particular project. However, if a larger framework for the desired ITS system exists within the MDOT ITS Architecture that can be used, to a limited extent, to identify gaps in existing specifications where new products or technologies will need to be identified by a future project. The Operational and Architectural Review will compare the new product's offerings to planned areas of the Architecture where new technology may be needed to be identified to accomplish the functions of the identified service package (s).

A request will be sent to the vendor for additional documents necessary to perform the review. After the review is complete a letter will be provided to the vendor either outlining the lack of identified Operational or Architectural need to or inviting the vendor to participate in a Concept Study.

- a. * Upon completion of the review, a product will not be reconsidered unless significant changes are made to address barriers to feasibility.
- 5. Concept Study: If the need review has determined interest by the Department; a concept study may be performed. The Department will work with the vendor to develop a unique concept study including, but not limited to timeline, criteria, location, etc. By performing a study, the Department does not guarantee an update of current specifications or that a new specification will be written. Study of product will be based on technological concept, not specific product instantiation.

APPENDIX A MANUFACTURER CHECKLIST





Manufacturer Checklist

Intelligent Transportation System Devices

Traffic Signals Technology as Identified in the "New Traffic Signal Device Product Review Guidelines"

Related Products and Services

INSTRUCTIONS: Please carefully review the NEW TRAFFIC SIGNAL DEVICE PRODUCT REVIEW GUIDELINES (link) prior to submitting this form. In addition to this document, you should have received a request for information (RFI) in a form of a spreadsheet. This document must be completed in its entirety, signed, and returned, along with any required supporting documentation. No provisions of this document may be modified or deleted by the Manufacturer or Authorized Representative.

	(Manufacturer/Authorized	d Representative)		, herein referred to as	
"M De	anufacturer/Authorized partment of Transp	Representative," in a portation, herein r	an effort eferred	to familiarize the Mich to as "MDOT,"	igan with
rep	(Description of Products DIESENTATIONS:	s or Services)		, makes the following	
1.	Are you the Product M	anufacturer?	Yes	No	
2.	Are you an Authorized	Representative recog If yes, please provide \$	nized by Supporting	/ the product manufactu p Documentation.	rer?
3.	INFORMATION (Check	all that apply)			
	MDOT wishes to rece contained in one or providing:	ive ALL of the followi multiple documents	ng inforr ; indica	national materials, whe te which item(s) you	ther are
	Sales brochure	🗌 Operator's Manu	ual [Service Manual	
	Installation Guide	U Warranty	[Specifications	
	Material Safety Dat	a Sheets (MSDS)	[None of the above	

4. Material Testing (Check all that apply)

Select the following standards in which your product or service is compliant? Indicate any independent testing laboratories or other entities that have approved/certified/listed/registered your product or service. Supporting documentation and/or certificates must be provided for any boxes checked.

		ASTM	CSA	
		🗌 NFPA	D PNS	
🗌 OSHA		🗌 US-EPA	🗌 ITE	
MASH	350	None of	the above	
Other:				

- 5. WARRANTY (Check all that apply)
 - 5.1. Manufacturer/Authorized Representative specifically guarantees MDOT that use of this product/service will NOT invalidate original equipment manufacturer (OEM) or distributor warranties for equipment, structures, or any other items that may be impacted by such use.
 - 5.2. Manufacturer/Authorized Representative has also attached documentation from the original equipment manufacturer (OEM) or distributor verifying that use of the product/service described will NOT invalidate original warranties, as indicated above.
 - 5.3. Manufacturer/Authorized Representative cannot guarantee use of this product/service will not void warranties of other equipment, structures, or items, but does assume full financial responsibility for resolving any issues stemming from the voidance of warranties that result from the use of Manufacturer/Authorized Representative's product or service.
 - 5.4. Manufacturer/Authorized Representative cannot guarantee use of this product/service will not void warranties of other equipment, structures, or items. (This may disqualify your product/service from further consideration.)

6. LOCAL REFERENCES (Must provide or check "None")

Provide references that have used this SPECIFIC product or service within the state of Michigan or the tri-state area. Attach additional sheets if more references are available.

6.1.	Contact Name:
	Organization:
	Location (City/State):
	Telephone: Ext:
	E-Mail Address:
6.2.	Contact Name:
	Organization:
	Location (City/State):
	Telephone: Ext:
	E-Mail Address:

- 6.3. None (Manufacturer/Authorized Representative cannot provide any references for this SPECIFIC product or service.)
- 7. COST OF SUPPLYING PRODUCT OR SERVICE FOR EVALUATION (Must check one or more)
 - 7.1. Manufacturer/Authorized Representative will provide product or service at NO CHARGE to MDOT.
 - 7.2. Manufacturer/Authorized Representative will also provide both installation and removal of product or service (including restoration of installation site to original condition) at NO CHARGE to MDOT.
 - 7.3. Manufacturer/Authorized Representative will also provide any necessary associated items, consumables, or other supplies at NO CHARGE to MDOT.

- 7.4. Manufacturer/Authorized Representative's commitment to provide items at NO CHARGE to MDOT, as indicated above, will expire on:
- 7.5. Manufacturer/Authorized Representative will NOT provide any product or service at no charge; MDOT will be expected to incur all associated expenses.

(Date)

- 8. RESPONSIBILITY (Must check one)
 - 8.1. Manufacturer/Authorized Representative agrees to defend MDOT and will not hold it responsible against any and all claims of liability related to use of Manufacturer/Authorized Representative's products or services.
 - 8.2. Manufacturer/Authorized Representative cannot agree to this Responsibility provision. (This may disqualify your product/service from further consideration.)
- 9. COST SAVINGS CLAIMS (Must check one)
 - 9.1. Manufacturer/Authorized Representative is providing written, detailed financial analysis supporting and demonstrating the cost savings claimed by the use of its product or service. This analysis shall include a return on investment (ROI) analysis and calculation of payback period, with all assumptions and calculations clearly shown.
 - 9.2. Manufacturer/Authorized Representative cannot provide the detailed financial/ROI analysis (as required above) to support its claims of cost savings.
 - 9.3. Manufacturer/Authorized Representative makes no claims whatsoever that any cost savings are associated with the use of this product or service.
- 10. ENERGY REDUCTION CLAIMS (Must check one)
 - 10.1. Manufacturer/Authorized Representative is providing written, detailed analysis supporting and demonstrating the energy reductions claimed by the use of its product or service. This analysis shall have all assumptions and calculations clearly shown. If a cost savings due to energy reduction is also claimed, see Section 9 (Cost Savings) above.
 - 10.2. Manufacturer/Authorized Representative cannot provide the detailed energy reduction analysis (as required above) to support its claims.
 - 10.3. Manufacturer/Authorized Representative makes no claims whatsoever that any energy reductions are associated with the use of this product

or service.

- 11. ENVIRONMENTAL, SUSTAINABLE, OR "GREEN" RELATED CLAIMS (Must check one)
 - 11.1. Manufacturer/Authorized Representative is providing written, detailed documentation supporting and clearly demonstrating how this product or service offers benefits that are "environmental," "sustainable," "green," or similar in nature. Such claims must be verifiable and supported by independent, third-party sources, and documentation of such support provided.
 - 11.2. Manufacturer/Authorized Representative cannot provide the required documentation (as required above) to support its claims of "environmental," "sustainable," or "green" related benefits.
 - 11.3. Manufacturer/Authorized Representative makes no claims whatsoever that "environmental," "sustainable," or "green" related benefits are associated with the use of this product or service.

12. ACKNOWLEDGEMENT

Manufacturer/Authorized Representative understands, acknowledges, and agrees to all of the following:

- 12.1. All responses (check marks, statements, etc.) made by the Manufacturer/Authorized Representative on this document are truthful and correct, and the responses have been checked for accuracy by representatives of the Manufacturer/Authorized Representative who are authorized to answer and who would have knowledge as to the accuracy of such responses.
- 12.2. Completion and signature of this checklist by the Manufacturer/Authorized Representative, or the supplying of products or services by the Manufacturer/Authorized Representative, does NOT obligate MDOT to use or attempt to use the products or services described herein.
- 12.3. The trial use of any product or service does not obligate MDOT to purchase additional product or service, nor does such use imply that MDOT intends to purchase additional product or service.
- 12.4. In the event MDOT does elect to pursue the purchase of this or similar products/services, the standard purchasing practices and requirements of the State of Michigan, including competitive bidding, will apply, and the Manufacturer/Authorized Representative will receive no preferential consideration.

- 12.5. The trial, testing, favorable evaluation, or any other review or use of a product or service does not constitute an endorsement or recommendation by MDOT. Manufacturer/Authorized Representative may not in any way promote, advertise, imply, or suggest to current or potential customers that any product or service has been tested, endorsed, approved, or recommended by MDOT.
- 12.6. Any testing/evaluation of this product along with any MDOT resource must be coordinated/approved by authorized personnel from the MDOT New Product Evaluation Team.

Manufacturer/Authorized Representative Acceptance and Signature:

(Signature of Manufacturer/Authori	zed Representative)
(PRINTED name of above individu	al)
(Title)	(Date)
For further information, ML	OOT may contact:
Name	
Address	
City/State/Zip	
Telephone	
E-Mail	

Please send this completed form and any required documentation to:

Terri Mears mearst@michigan.gov